THE AMERICAN

JOURNAL OF PHARMACY.

*DECEMBER*, 1875.

## NOTES ON DILUTE PHOSPHORIC ACID.

BY W. H. PILE.

(*Read at the Pharmaceutical Meeting, November 16th.*)

The subject of dilute phosphoric acid has been pretty thoroughly investigated of late, and much valuable information has been the result. In two particulars it has been rendered evident that the second process of the U. S. Pharmacopœia for preparing this acid is unfitted for that purpose, and should consequently be expunged from our codex. The proof of this assertion is shown by the finished production not being free from metaphosphoric or pyrophosphoric acids, and consequently precipitating a basic phosphate or pyrophosphate of iron, when mixed with tincture of chloride of iron, as frequently prescribed. A second reason why the process fails, arises from the universal contamination of the glacial acid with phosphate of sodium, in some cases amounting to 30 per cent., as shown by Professor Remington in a paper read before the meeting of the Pharmaceutical Association, held in Boston last September.

We are thus thrown upon the first process of the Pharmacopœia, a method which, when carefully performed, always proves satisfactory, more especially when ended—but certainly annoying enough to deter any—but the most persevering lover of chemical science, from repeating the experiment, not to say anything of the danger constantly arising from the scintillations of burning phosphorus and suffocating vapors of nitrous acids.

To shield the conscientious pharmacist from these serious consequences, while preparing a remedy so desirable and yet so seldom met with (our esteemed friend), Professor Markoe, of Boston, after deep thought and careful investigation of the interchange of chemical

reaction between such spiteful elements as phosphorus, bromine and nitric acid, and then by actual experiment with the same, cautiously conducted, has arrived at certain definite results, which has led him to propose a new formula for this desirable purpose, the whole *modus operandi* of which was published in the various pharmaceutical journals for October of this year, being an abstract from his interesting and valuable paper read at the last meeting of the Pharmaceutical Association, and which it is not necessary for me to repeat here.

Professor Maisch, in our journal for November, has correctly reported the result of my first experiment in this direction, and it proved certainly a very striking one, leaving a deep impression upon me which, no doubt, will be permanent. The result, however (I can assure you), was not at all satisfactory, and as soon after as I recovered from my confusion, I repeated the experiment, not, however, in the same way, but according to a modification suggested to me by Professor Markoe, which is likewise given in the Journal of Pharmacy for the present month.

The result, I am pleased to report, was very satisfactory, everything proceeding quietly and slowly as there stated, the application of heat being unnecessary. At the close of the operation and when all the phosphorus had disappeared, the evaporation was carried on by heat as directed in the Pharmacopœia.

This final part of the process here, as well as in the usual method, I have found the most disagreeable feature of the whole proceeding, requiring the temperature to be carried up to 420° F., at least, before the whole of the free nitric acid can be driven off, and the vapors of acid at this temperature prove exceedingly annoying. When entirely inodorous, the fire should be withdrawn and the syrupy concentrated solution allowed to cool, previous to being diluted with water. At the temperature of 60° the dense acid made as above was found to have the gravity of 70° B., nearly twice as heavy as water, and required about fifteen times its bulk of water to reduce it to the proper gravity of 1·056. I will only add that the final evaporation of this acid cannot be performed in enamelled iron vessels, as by experiment I found the enamel to be dissolved off when the temperature was much over 300°. Porcelain alone should be employed.

## A MODERN CLASSIFICATION OF MEDICINES.

BY C. F. RINGLER, M. D.

The various efforts made from time to time by writers on, and teachers of, Materia Medica and Therapeutics, to establish uniform systems of classification of medicinal substances, have not, as yet, as medical and pharmaceutical literature amply shows, been rewarded by much appreciation on the part of the profession; a fact deeply to be regretted, if we consider that not a few of the proposed measures are possessed of qualities of merit. However, whether this disregard be due to faulty construction and lack of rationality in the different plans suggested, or whether it be due—as in many instances it doubtless is—to too hasty condemnation, it matters but little, since, it is but fair to presume, the day that is to give us a system, meritorious enough in all its detail to claim and secure universal adoption, at least in the United States, has not, as yet arrived.

Modern times require and demand, as experience teaches and observations daily demonstrate, new and broad ideas, and he who is capable of being original, whether it be in science, art or literature, generally succeeds better in his efforts and claims to general recognition than he who, though perhaps more learned, persists in advocating what was once regarded as infallible. Hence it is, that authors like Dr. Headland, of England, and other similar thinkers and investigators in the field of science, probably have succeeded better than many others in their endeavors to bring about reformation in the department of therapeutics as well as in the classification of remedies.

A very novel and ingenious method of classifying medicines, based on the doctrines of Dr. Headland, is the plan adopted, and employed for some years past, by Professor W. H. Thomson, of the University of the City of New York, which, as it may prove instructive and interesting, and as it has not, as yet, to the knowledge of the writer, appeared in print, is given here briefly and condensed as follows:

### PROF. THOMSON'S CLASSIFICATION.

All medicinal substances are divided into two great classes, each class being subdivided into orders and sub-orders.

CLASS I.—*Medicines for diseases or diseased status.*

*Order* 1.—RESTORATIVES: Agents which are natural to the blood, because they either themselves are ingredients of the blood or are analogous to such ingredients.

*Order* 2.—SPECIFICS: Agents which are not natural to the blood, and therefore poisonous.

CLASS II.—*Medicines for symptoms or transient complications.*
*Order* 1 —NARCOTICS.
*Sub-order* 1.—Medicines, both stimulants and sedatives at the same moment.
2.—Stimulants only.
3.—Sedatives only.
*Order* 2.—ELIMINATIVES, OR GLAND MEDICINES.
*Sub-order* 1.—Cathartics.
2.—Emetics.
3.—Expectorants.
4.—Diuretics.
5.—Diaphoretics.
*Order* 3.—ASTRINGENTS.
*Sub-order* 1.—Mineral astringents.
2.—Vegetable astringents.

Although upon a first glance, the advantages of this model plan over others may not become apparent, in studying its essential points more closely, and upon some reflection on well-known facts in physiology, its merits are easily and readily detected. But whatever its merits or demerits may be, it would be useless to deny that, if a true scientific foundation, brevity and comprehensiveness be the chief end desired, Professor Thomson has certainly most admirably succeeded in creating a system, which, at least, in a strictly therapeutical point of view, must be regarded a valuable addition to modern medicine, destined sooner or later to occupy a foremost place, but which, like most innovations, will, it is feared, encounter much hostility.

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## NOTES ON SOME MEDICINAL AND DIETETIC ARTICLES.

BY X. LANDERER, ATHENS, GREECE.

(*Read at the Pharmaceutical Meeting, November 16th.*)

*The toxical effects of Conium.*—While examiming a student at the University, I inadvertently chewed some fresh *Conium maculatum*, and soon experienced its toxical effects, consisting principally in giddiness, headache and symptoms of amblyopia. Returning to my room, I was forced, notwithstanding my feebleness, to walk in a circle around the center-table until I fell down. Lemonade, coffee and carbonic acid water produced, after vomiting, a long sleep, and after a day all symptoms had disappeared, except some pain and weakness.

The symptom noted above is expressed in the name of the plant *Conium*, which is derived from *Κωνάω*, to turn in a circle, because the

intoxicated person is inclined or obliged to move in a circle. Such a symptom is not described in connection with the death of Socrates, and it is therefore probable, as has been accepted from the time of Plinius, that he was not poisoned by *conium*, but probably with a narcotic poppy, *μηκων*, perhaps opium.

In ancient times, many philosophers, generals and other celebrated persons were poisoned by *conium*, and in the island of Zea was a law compelling old men, who were useless for the State, to be poisoned with this plant, and that a convenient dose of the juice was 12 drachms = 1½ ounces. Among the interesting archeological relics found in this island was a clay vessel, which held exactly 12 drachms of water, and it is possible that this and other similar vessels served to measure the deadly dose of the juice of this plant.

*Remedy for the bite of rabid dogs and venomous snakes.*—Many persons are annually bitten by the animals named. The priests in the monastery of the island of Salamis possess an interesting remedy, known from the most ancient epochs. It is prepared from the bark of the root of *Cynanchum erectum* and the powder of *Mylabris variegata*, from 4 to 6 grains of the former and ¼ to ½ grain of the latter being given pro dose, and from 40 to 60 such doses administered.

This species of *mylabris* was the *Κανθαρις* in the time of Hippocrates, and contains more cantharidin than than the Spanish fly. Dioscorides says: Cynanchum (derived from *Κυων*, a dog), *quod canes, lupos, vulpes et pantheras necat*; also of Apocynum *quod canes et omnes quadrupedes necat.*

The remedy above alluded to deserves to be investigated as a prophylactic against hydrophobia, which is here called *lyssa*.

*A sophisticated valerianate of quinia*, imported from France, was noticed by me some time ago. Previously, I had made the interesting observation that true valerianate of quinia, when triturated in a mortar, showed in the dark a beautiful phosphorescence. The article in question, not possessing this property, was examined, and found to consist of sulphate of cinchonia, mixed with oil of valerian and valerianic acid.

*Saffron* grows in many parts of Greece, but is found principally in the islands of Naxos, Mykone, Simi and Tinos. It is collected by poor women and children, and sent in small lots to Smyrna. This *Crocus hellenicus* is among the best varieties of saffron.

*Rhodosaccharis* is the name given to a confection of rose, which is

prepared not only by the confectioner, but in every family. The rose-flowers are collected in the month of April, and put into a very strong syrup. This *Τριάνταφύλλογλυκον* (triantaphyllon = rose ; glyko = sweet) is very much liked ; it is very agreeable to the taste, and has an evacuative effect.

*Mastichglyco* is an oriental confection, which is prepared by concentrating syrup in the presence of powdered mastich, and has an agreeable balsamic taste. The decoction of mastich is extensively employed in the orient as an efficient remedy against diarrhœa infantum, a cataplasm being used at the same time, which is called *krasopsomon*, wine-bread, and is made by boiling bread in wine, the powder of different aromatic herbs being afterwards added.

*Crithmum maritimum* is commonly preserved in vinegar, and eaten with meat like the flowers of *Capparis spinosa*. After the disappearance of most other plants, this is quite an ornament to the fields of Greece.

*Kaissopyta* is prepared only in the island of Cyprus, and exported to Alexandria, occasionally also to Constantinople. It is made from the pulp of *Prunus armeniaca*, the apricot, called by the Turks *kaissăă* ; the pulp being spread upon marble is dried, then rolled up like cloth and preserved, to be eaten during the winter in place of fruit, pieces being cut off with shears.

*Betmése* is the name given to the unfermented grape-juice, which is evaporated to the consistency of syrup, ashes of the grape-vine being added for the purpose of increasing the sweetness, the carbonate of potassium neutralizing the free acids. Betmése is eaten with bread by the rich and poor, and is extensively used for preparing other confections and preserves. The fruits of *Solanum melongena* and of the cedro are thus preserved, and in the island of Eubœa and in many other parts of Greece, almonds and nuts are strung upon threads and repeatedly dipped into betmése, until the kernels are sufficiently covered, when they are dried, and are then called *sousukea*. Starch, *neseste* of the Turks, is likewise mixed with this grape-juice, and after boiling and refrigeration forms a jelly called *moustopyta*, which is cut into pieces, and is highly esteemed. Benne seeds, almonds and other aromatics are sometimes added to this jelley, which is then dried in ovens, and kept for use during the winter.

*Arbutus Unedo* is a beautiful tree, found in all the forests of Greece,

and an ornament of the oriental gardens. The excellent fruit of this tree resembles a large strawberry, and is collected by the poor and sold during the winter; it has a pleasant taste, but in large quantities is apt to produce indigestion. Plinius says of it: *Unedo unum fructum edas. Arbutus sive unedo fructum fiat difficile concoctionis.*

In some parts of the country a spirituous liquor, called *Paki*, is obtained from the fruit by fermentation.

*Laurus nobilis* was, in ancient times, consecrated to Apollo, hence it is called *Laurus Apollonis*. This handsome tree is met with in the forests of Greece, and is extensively cultivated in the gardens of cloisters. The seed of this tree resembles the seed of the olive, known here by the name of *daphnekoukou*, after the name of the tree *Λάφνη*. The seeds could be utilized for obtaining the highly aromatic fixed oil, which I have often expressed and consider more aromatic than the same oil obtained from other localities. It seems as if in warmer climates the aromatic principles of plants were more profusely developed, like the bitter and astringent principles in colder regions.

*Solanum lycopersicum*, the tomato, is one of the most useful plants in the orient, where it is raised in every garden and the fruit eaten by rich and poor, the agreeable color and pleasant flavor which it imparts to other dishes being well liked. By expressing the juice and concentrating it by evaporation in the sun, it may be preserved for a year, and when dried in ovens it will keep well for several years. The fruit is frequently salted, and may then be transported. It is also employed medicinally, the pulp, called *domata*, being considered of utility in gravel and against chronic rheumatism.

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## SELECTIONS FROM DANISH JOURNALS.

BY HANS M. WILDER.

I. *Syrupus Arseniatis Ferrosus.* By H. P. Madsen.—Having seen a circular from Clermont, a French Pharmacist, recommending a syrup containing ferrous arseniate in solution, Madsen attempted its preparation.

If a solution of ferrous sulphate is added to one of sodic arseniate, a white precipitate of ferrous arseniate is formed, which soon, however, turns dirty gray, and is transformed into basic ferric arseniate; when dry, the color is grayish-green.

Madsen found that a solution is easily effected if citric acid be added

to the solution of sodic arseniate before adding ferrous sulphate. He proposes the following formula for the syrup, taking the solution of sodic arseniate of Phar. Danica as basis=(1 part of the solution in 500 parts of water equal to 0·36 arsenic acid).

℞ I. Solution. sod. arseniatis, . . . . . grm. 45·00
Acid. citric., . . . . . 0·05
Dissolve.
II. Ferri. protosulph., . . . . . 0·09
Aquæ dest., . . . . . 5 00
Dissolve.
Add II to I and afterwards,
Syrup. sacchari, . . . . . 450·00
M.

10 grm. contain 1 mgrm. ferrous arseniate.—*Ny Pharm. Tid.*, 1875, p. 295.

II. *Phosphorized Codliver Oil.*—0·02 grm. phosphorus dissolve by heat in 30·0 grm. codliver oil.—*Ny Pharm. Tid.*, 1875, p. 298.

*Test for Ammonia.*—J. Moddermann (*Viertelj. f. pr. Ph.*) observed by dissolving sulphate of copper in sufficient distilled water, that when he added more water the previously limpid solution grew turbid, with a greenish hue, and that a precipitate of the same color was thrown down. By examination he found the precipitate to be basic sulphate of copper, and the reason for this to be the presence of ammonia in the distilled water. Ammonia being present only in minute quantity, explains how the solution first is clear and only by excess of water gets turbid. Sulphate of copper is then a very sensitive test for ammonia.

(The same turbidity happens if neutral solution of chloride of iron is largely diluted with water.)—*Ny Pharm. Tid.*, 1875, p. 326.

III. *Hydrocyanic Acid.*—It has hitherto been thought impossible to detect this acid in the body after some days have elapsed. Sokoloff (Ber. d. russ. Ges.) has recently shown the possibility of detecting it after twenty-two days had passed (in dogs having taken 0·028 grm. hydrocyanic acid). He says that it will not be found in the first distillate of the contents of the stomach with diluted sulphuric acid, but it will be found in the second. This seems to show that hydrocyanic acid does not exist in the body as a single compound, but as a double cyanide, which is not so easily decomposed by a diluted acid.—*Ny Pharm. Tid.*, 1875, p. 325.

*Crystallized Nitrate of Zinc* has been recommended as a caustic. It is treated similarly to sulphate of copper by melting it in its own water of crystallization.

A caustic paste is prepared from 100 parts nitrate of zinc, 50 parts of water and 50 flour; if this paste be wanted in the form of sticks, it is necessary to dry them by as little heat as possible, else they become very brittle.—*Ibid.*, p. 328.

*Decoction of Cinchona Bark, with and without Acid.*—Mr. Krog-Jenson has examined into the percentage of alkaloids contained therein, and found that the plain decoction contained 41–43 per cent., and the acidulated 73–75 per cent. The residue containing respectively 59–57 per cent., and 27–25 per cent of the alkaloids.—*Arch. for Ph.*, 1873.

*Chloroform.*—H. P. Madsen confirms Rump's statement, that it requires a large quantity of water to separate the alcohol from chloroform. Ph. Danica requires chloroform to be shaken with an equal weight of water. Mr. M. did not obtain a higher sp. gr. than 1·457, but by using a fourfold quantity of water he obtained a chloroform of sp. gr. 1·490.—*Arch. for Ph.*, 1875, p. 281.

*Sulphate of Quinia.*—The Swedish Pharmacopœia requires, among other tests, that the aqueous solution must remain clear after addition of water of ammonia (Kerner's test*). Mr. B. Lindeman (Stockholm), having several times found that solutions of sulphate of quinia of undoubted purity did not mix clear until after several minutes, lays stress on the following points: 1. That the temperature of the water not exceed 60° F. 2. That the water of ammonia have the right sp. gr; and 3. That the test tube be only turned up and down and not shaken violently.—*Arch. for Ph.*, 1875, p. 328.

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## ON THE VENDING OF NOSTRUMS.

BY THOS. D. McELHENIE, PH. G.

(*Read before N. Y. Alumni Association of Phila. Coll. of Pharmacy, Nov. 2d.*)

An editorial in the "Medical Record" of October 9th, entitled "Shall it be a profession or a trade?" treats of pharmacy in its commercial phase, and the writer improves the opportunity to indulge in certain thrusts at pharmacists as venders of patent medicines.

He diagnoses "an over-sensitiveness of the pocket nerve," and holds the following language: "Some of the semi-medical preparations thus sold have long since been proven by analysts to be possessed of posi-

* Kerner's test will be found, "Am. Jour. Ph." (1862), xxxiv, p. 417, and particularly 426.

tively deleterious, if not absolutely poisonous, properties, and yet, because the public, so called—a name which in this case is almost a synonym for the non-educated portion of the community—seek them, the druggist finds a convenient excuse for indulging in a traffic that is pecuniarily profitable."

The insinuation of the remark quoted, to the effect that the pharmacist regards the sale of patent medicines as an indulgence, and is glad of the excuse of popular demand, behind which to screen himself, is most unkind and unjust to the respectable minority in the profession, who regard this feature as a nuisance, and would gladly aid in its discontinuance.

But, as yet, the fact remains, that patent medicines of all sorts flood the market, and the public buy them, and buy them, too, of the apothecary because, by long usage, his shop is the most natural place to look for anything in the medicinal line. The nostrum-buying public would feel flattered at being told by their physicians that they comprised "the non-educated portion of the community." Such statements, however, would not be true in fact, as it is within the writer's knowledge that among the patrons of certain nostrums are numbered many of the best-educated people, notably the clergy, who have an unaccountable propensity for endorsing nostrums, by which they incur a great responsibility.

It may be well to consider some phases of the "over-sensitiveness of the pocket nerve," which the "Record" concedes as generally prevalent.

It prompts the patient to buy patent medicines, because, if they cure him, it will probably be at less cost than regular treatment by a physician; and as he in most cases *imagines* they will cure, they often do.

The same affection prompts the pharmacist to sell patent medicines: because the public demand them, there is little trouble attending their sale, and the profit helps eke out his ofttimes scanty income. It also prompts the physician to object to the sale of nostrums, as thereby his business is more or less affected, and consequently his bank account.

Admitting, then, the existence of the state of things described, and recognizing its injurious influence upon the public health, what is the remedy? In the opinion of the writer, it is *not* the measure proposed by the "Record," viz., a peremptory refusal on the part of the pharmacist to sell these nostrums. As the growth of the evil has been gradual, so its diminution must be accomplished by mild, but constant

and well-directed efforts on the part of *all* pharmacists. The medical profession is powerless in the matter, as any protest uttered by physicians would be ascribed to interested motives. To the pharmacist, then, we must look for alleviation of this nuisance. To this end it is important that he should realize his responsibility as the purveyor of medicines, and, conjointly with the physician, as conservator of the public health. As a person of skilled judgment in such matters, his opinion is deferred to by his patrons, when he takes the trouble to express it. His duty, then, is: never to recommend a patent medicine, keep no advertising matter setting forth their merits, allow no display of signs and show-cards, etc., in his shop, and, if possible, as it often is, keep such nostrums out of sight of the public, to supply only on customer's order, provided he cannot prevail upon him to consult a physician or to try some remedy which he shall prescribe.

A peremptory refusal to supply a patent medicine would only send the customer to the next drug store, or, supposing there to be unanimity among pharmacists on this point—a thing impossible—the proprietors of the tabooed preparations would establish agencies at other places of business, and thus the business of the apothecary would suffer without materially affecting the sale of the nostrum.

On the other hand, it is believed that a judicious and dignified pursuance of the course indicated above would secure to the pharmacist the respect of his patrons, thus inuring to his pecuniary advantage, while gradually doing away with the traffic in articles whose properties and composition are unknown alike to buyer and seller.

The "Record" characterizes as a "halfway measure" the proposed issuing of an almanac by pharmacists, and says "it will be incomplete, unsatisfactory and impracticable." Such advertisement will no doubt be appreciated by the publisher and editor with whom the "Popular Health Almanac" is an accomplished fact.

In the writer's opinion, "halfway" measures are more likely to succeed in this matter than the violent one of absolute refusal; and the substitution of the proposed almanac for the rubbish with which our counters are (by our leave) annually flooded, will go far toward lessening the demand for patent medicines.

In conclusion, it is suggested that two joint committees be appointed at the next annual meeting of the national medical and pharmaceutical associations, one of these being instructed to prepare a series of formulæ for household remedies, providing a suitable variety of each class

to meet the varied wants of the family. These formulæ, brought to the notice of and adopted by pharmacists, would measurably lessen the sale of nostrums among the large class who are unwilling to call a physician for every little ailment. The duty of the second committee should be to obtain information relative to the laws governing the granting of patents on articles of a medicinal or cosmetic nature, and endeavor to secure by legislation greater stringency in these laws, and thus diminish the forces of the enemy.

From the Patent Office at Washington I have the following data, showing a gratifying declension in the issuing of patents on "Medical Compounds." There have been granted in all about 650.

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| In 1872 there were issued, | . . . | 68 |
| In 1873 " | . . . | 39 |
| In 1874 " | about . . . | 30 |

As the number of items in the catalogue of the leading American dealer is probably several thousand, it is evident that a large majority of "Patent Medicines" are *not* patented, after all.

*Flatbush, L. I., November*, 1875.

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## GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

*Solutions of Alkaloids in Oil.*—Mr. J. B. Barnes suggests the use of glacial acetic acid as a means of preparing such solutions when required for liniments. It is well known that this acid mixes with fixed and essential oils in all proportions. Solutions of aconitia, atropia, morphia and veratria, in glacial acetic acid, unite with almond oil and oil of turpentine, forming clear solutions, which, after exposure in unclosed test-tubes for several days, remain clear and without change; quinia and cinchonia also unite with almond oil when dissolved in glacial acetic acid. These solutions may be made of any desired strength, and do not lose their transparency when mixed with chloroform and camphor.—*Phar. Jour. and Trans.*, 1875, Sept., 11.

*Linimentum Terebinthinæ Aceticum.*—In a paper read before the British Pharmaceutical Conference, W. Symons proposes a modification of the formula of the British "Pharmacopœia," as follows:

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| Take of Glacial acetic acid, . . . . | one part |
| Spirit of camphor, . . . | two parts |
| Castor oil, . . . . . | one part |
| Turpentine, . . . . | two parts |

Mixed in this order, the above makes a perfectly clear and stable solution; also, the following:

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|---|---|
| Camphor liniment, | two parts |
| Castor oil, | two parts |
| Turpentine, | two parts |
| Glacial acetic acid, | one part |

These proportions may be conveniently modified and volatile oils added, if desired. A fixed oil, soluble in alcohol, seems essential, as a blending medium, to obtain a perfect solution.—*Ibid.*, Sept. 4.

[For *turpentine*, in these formulas, the *oil of turpentine* appears to be intended.]

*Coto Bark.*—Under this name a bark, coming from the interior of Bolivia, was received in Hamburg, and submitted to Dr. Wittstein for chemical analysis. The constituents were found to be a highly aromatic volatile oil, having a biting, peppery taste; a volatile alkaloid, probably propylamia or trimethylamia; a soft, aromatic resin, with a biting taste; a brown, brittle resin, the alcoholic solution of which has a bitterish taste, and which is insoluble in ether, benzol, chloroform and bisulphide of carbon. Besides the preceding, the following constituents were found, in smaller quantities: starch, gum, sugar, oxalate of calcium, tannin (turning iron salts green), formic, butyric and acetic acids.

Though the tree yielding the bark was stated to be a species of cinchona, the microscopical examination made by Prof. C. Harz proved this not to be the case; the bark comes most likely from a lauraceous or terebinthaceous tree. The bark has been employed in the Munich Hospital, by Prof. von Gietl, who regards it as a specific against diarrhœa in the most varied modifications. The remedy was used in doses of 0·5 gram, four to six times daily, in the form of powder, which occasionally produced emesis. The tincture was made by macerating one part of the powdered bark with nine parts of alcohol, and was given in doses of ten drops every two hours.—*Archiv d. Phar.*, 1875, Sept., p. 213–223.

*Method for Preparing Mercurial Ointment.*—Dr. Richard Mors proposes the following:

Put into an iron or stone mortar:

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| Mercury, | 500 grams |
| Mercurial ointment, 1-2 mercury, | 60 grams |
| Glycerin, | 30 grams |

Triturate well the mixture until the complete division of the mercury is effected, for which about ten minutes is required. When metallic globules cannot be detected with the naked eye, add in succession 170 grams of fat. By this method the complete extinction of the mercury in the fat is accomplished, and the ointment is finished in about half an hour.—*Revista armaceutica*, Buenos-Aires, 1875, p. 150.

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## EMETINA.*

BY A. GLENARD.

In a note recently presented to the French Academy the author has described the first portion of an investigation of the alkaloid of ipecacuanha. The following is a *résumé* of the principal results:

*New process for the Extraction of Emetina.*—The author's process is based upon the combined use of lime and ether. It consists in treating with ether a suitably prepared powder, or an extract of ipecacuanha and lime, or the precipitate formed upon adding an excess of lime to a solution obtained by treating ipecacuanha in the cold with water acidulated by sulphuric acid. Either of these mixtures, or the precipitate, when treated with ether, will yield all the alkaloid it contains.

The alkaloid may be obtained from the ethereal solution by distilling it to dryness and treating the residue with acidulated water, or by at once shaking the solution with acidulated water. A more or less acid aqueous liquid is thus obtained, which, upon the addition of ammonia, yields the emetina almost colorless, and much more pure than that produced by the processes ordinarily employed.

*Preparation of Crystallized Hydrochlorate and Pure Emetina.*—When water, acidulated with hydrochloric acid, is employed to remove the emetina from the ether, an acid solution is obtained, which, when sufficiently concentrated by evaporation, forms a nearly colorless, solid, crystalline mass. This mass is formed of extremely delicate needles, formed in bundles that radiate around a central point, and form small spheres with an embossed surface, resembling mulberries in appearance. Upon pressing these crystals in a cloth, the more or less colored mother liquor runs off, and the crystals redissolved in water give a colorless solution, from which a fresh crystallization of perfectly pure hydrochlorate of emetina can readily be obtained.

The production of this crystallized hydrochlorate of emetina is wor-

* From the *Journal de Pharmacie et de Chimie* for September, p. 178.

thy of notice, since it does not accord with what has been stated by previous authors, who have all considered emetina to be incapable of forming crystallizable salts. It is especially interesting in that it furnishes a convenient and certain method of obtaining perfectly pure emetina, for which it is only necessary to precipitate a solution of the hydrochlorate with an alkali. But it is important to observe that ammonia does not precipitate all the emetina of the hydrochlorate, and that the precipitate is less in proportion as the salt is more acid. It might appear from this that emetina is soluble in hydrochlorate of ammonia. But the author finds that it is the result of a decomposing action exercised by the emetina upon the hydrochlorate of ammonia, as is shown by the following two experiments. If a little dry powdered emetina be placed in a glass containing a solution of hydrochlorate of ammonia it may be observed to agglomerate and become transformed into a soft resinoid mass; at the same time the disengagement of ammonia may be recognized, and the resinoid mass gradually undergoes a kind of metamorphosis and becomes white and crystalline. Again, if emetina in powder be suspended in water and solution of hydrochlorate of ammonia be gradually added, the emetina is dissolved, and upon evaporation of the solution, crystals of a double hydrochlorate of emetina and ammonia are obtained.

The author believes the decomposition of hydrochlorate of ammonia by an organic alkali to have been hitherto unobserved. It does not appear, however, that emetina is alone in this action, as the author has observed that quinia, under similar conditions, behaves in the same manner.

*Composition of Emetina and its Hydrochlorate.*—These substances, dried at 110° C., gave upon analysis results corresponding with the following centesimal composition:

| | Emetina. | Hydrochlorate of Emetina. |
|---|---|---|
| Carbon | 72·25 | 63·00 |
| Hydrogen | 8·61 | 8·15 |
| Nitrogen | 5·36 | 4·75 |
| Oxygen | 13·78 | 11·64 |
| Chlorine | —— | 12·46 |

From these figures the author has constructed the following formulæ:—

$\underbrace{C_{30}H_{22}NO_4}$ Emetina. $\qquad$ $\underbrace{C_{30}H_{22}NO_4 \cdot HCl}$ Hydrochlorate of Emetina.

—*Phar. Jour. and Trans.*, 1875, Sept. 11.

## FURTHER RESEARCHES ON THE CHRYSTALLINE CONSTITUENTS OF BARBADOES AND SOCOTRINE ALOES.*

BY WILLIAM A. TILDEN, D.SC. LOND., F.C.S.

The names employed in the following pages to designate the crystalline principles obtained from the several varieties of aloes are to be understood as folloes:—

*Barbaloin.*—From Bardadoes aloes. Discovered by Smith and Co. of Edinburgh, and analyzed by Stenhouse, 1851.

*Socaloin.*—Isolated from Socotrine aloes in 1856, by T. B. Groves.

*Nataloin.*—Discovered by Flückiger, 1871.

*Zanaloin.*—Prepared by Histed, from a variety of socotrine aloes imported by way of Zanzibar. Analyzed by Flückiger, 1871.

Before proceeding to the comparison of the properties of these bodies, and the discussion of their chemical constitution, I propose to describe briefly some additional experiments lately conducted in my labratory upon the aloin from Zanzibar aloes. All the new analyses included in the following account were made for me by Mr. W. A. Shenstone, to whose care and patience I take this opportunity of expressing my obligations.

*Zanaloin.*—I am indebted to Messrs. Hanbury, of Plough Court, for liberal supplies of very fine Zanzibar aloes, from which the specimens of aloin now produced were prepared. Without such aid, in fact, the experiments must have come to an end prematurely, as I found it impossible to obtain appreciable quantities of the crystalline constituent from commercial samples of the drug produced from other sources. The process employed for its isolation was devised by Mr. Histed, and although rather troublesome and not very productive, I have not succeeded in improving upon it. It consists in macerating the coarsely powdered aloes with a sufficient quantity of proof spirit to make a paste, and afterwards gradually expressing the liquid from the mass. The yellow cake which remains is purified by crystallization from water, and then from rectified spirits.

The aloin obtained in this way has already been described by Dr. Flückiger (Year-Book of Pharmacy, 1871), and in the main my observations agree with his. I have found that when dried by exposure to air at the ordinary summer temperature the quantity of water it contains varies perceptibly from day to day, and it is difficult to get it into

* Read before the British Pharmaceutical Conference.

such a condition as to retain a constant weight. By exposure in a vacuum over sulphuric acid it loses weight rapidly, and two determinations made in this way gave 14·06 and 13·9 per cent. respectively. The loss of weight experienced upon exposure to a temperature of 115° to 120° C. was somewhat greater than this—14·46 and 15·95 per cent. in two recorded instances—but this greater loss is in all probability due to partial decomposition, the aloin fusing and becoming darker in color.

Two determinations of carbon and hydrogen made upon the air-dried substance gave these results:

| | I. Twice Crystallized. | II. Crystallized Three Times. | Mean. |
|---|---|---|---|
| C | 52·70 | 52·87 | 52·78 |
| H. | 6·42 | 6·39 | 6·40 |

No great importance, however, attaches to these numbers in consequence of the uncertainty regarding the hygroscopic condition of the substance.

After drying in a vacuum over sulphurie acid three combustions were made with the results indicated below. In all these and subsequent analyses the substance was burnt with a mixture of lead and potassium chromates, all the usual precautions being observed:

I. ·2926 gram of anhydrous zanaloin gave ·6379 of $CO_2$ and .1528 of $H_2O$.

II. ·2650 gram gave ·5792 $CO_2$ and ·1370 $H_2O$.

III. ·2606 gram gave ·5678 $CO_2$ and ·1380 $H_2O$.

| | I. | II. | III. | Mean Percentage. |
|---|---|---|---|---|
| C | 59·45 | 59.60 | 59.42 | 59.49 |
| H | 5·80 | 5·74 | 5·87 | 5·80 |

Dr. Flückiger gives 59·20 and 5·94 as the percentages of carbon and hydrogen in zanaloin dried over sulphuric acid, but the slight discrepancy may be accounted for by the more complete dryness of the substance operated upon by us.

*Bromozanaloin.*—The aloin upon which I have been operating was prepared from aloes, taken, I am informed, from she same sample upon which Flückiger made his experiments. I have also been careful to prove by repeated application of the test, that my zanaloin gives the same reaction with nitric acid and other oxidizing agents as the zanaloin examined in the laboratory at Bern. We have been more fortunate than Professor Flückiger in the production of definite brominated and chlorinated derivatives from this body. By dissolving zanaloin in

water and adding an excess of bromine water to the solution, a yellow precipitate was obtained, which, after two crystallizations from spirit of wine and drying *in vacuo*, gave the following analytical results:

I. ·3537 gram gave ·4485 of $CO_2$, and ·0942 of $H_2O$.

II. ·3442 gram gave, by heating in a sealed tube with nitric acid and nitrate of silver, ·3405 of AgBr.

*Percentages.*

| | I. | II. |
|---|---|---|
| C | 34·57 | —— |
| H | 2·95 | —— |
| Br | —— | 42·09 |

Another specimen made by reversing the operation, pouring the solution of aloin into excess of bromine water, and allowing the mixture to stand some hours before collecting the precipitate, gave results which differ slightly from the foregoing. The proportion of bromine found in this case being somewhat greater, and of carbon and hydrogen somewhat less than before.

The air-dried substance lost in this case 8·22 per eent. of its weight by exposure in a vacuum:

I. ·2769 gram of bromozanaloin dried *in vacuo* gave ·3458 of $CO_2$, and ·0670 gram of $H_2O$.

II. ·5970 gave by ignition with lime ·6043 of bromide of silver.

*Percentages.*

| | I. | II. |
|---|---|---|
| C | 34·05 | —— |
| H | 2·65 | —— |
| Br | —— | 43·06 |

*Chlorozanaloin.*—This body was obtained by the action of hydrochloric acid and chlorate of potassium. The crystals are bright yellow and lustrous, and closely resemble those of chlorobarbaloin. They gave off 13·65 and 14·47 per cent. of water when exposed to a temperature of 110° to 115° C.

I. ·3608 gram dried at 110° gave ·3644 gram of chloride of silver.

II. ·6393 gave ·6496 of AgCl.

*Percentages.*

| | I. | II. | Mean. |
|---|---|---|---|
| Cl | 24·97 | 25·12 | 25·04 |

*Acetyl-zanaloin.*—Dry zanaloin was boiled for nearly half an hour with about three times its weight of acetic anhydride. The solution diluted with a little alcohol and poured into water gave a pale yellow

precipitate which could not be made to crystallize from either alcohol, or ether. After drying in the air it gave off mere traces of water *in vacuo*.

I. ·2196 gram gave ·4755 of $CO_2$, and ·1063 of water.

II. ·2732 gram gave ·5874 of $CO_2$, and ·1328 $H_2O$.

*Percentages.*

| | I. | II | Mean. |
|---|---|---|---|
| C | 59.05 | 58·63 | 58·84 |
| H | 5·37 | 5·39 | 5·38 |

*Acetyl-barbaloin.*—Prepared in the same way is a yellowish white curdy substance, the analysis of which gave the following numbers:

I. ·2774 gram gave ·5976 of $CO_2$, and ·1334 of $H_2O$.

II. ·2150 gram gave ·4630 of $CO_2$, and ·1064 of $H_2O$.

*Percentages*

| | I. | II. | Mean. |
|---|---|---|---|
| C | 58·55 | 58·73 | 58·63 |
| H | 5·34 | 5·49 | 5·41 |

Leaving out of consideration the question of the formula deducible from these figures, I propose now to compare them with the results which have been obtained by different experimenters in operating upon the aloin of Barbadoes aloes.

*Barbaloin.*
(*dried in vacuo.*)

| | (Stenhouse (average.) |
|---|---|
| C | 59.31 per cent. |
| H | 5·88 " |

*Bromobarbaloin.*

| | Stenhouse (average.) | Tilden.* |
|---|---|---|
| C | 35.48 | 34.66 |
| H | 2·78 | 3·04 |
| Br | 51·97 | 41·96 |

*Chlorobarbaloin.*

| | Tilden (1872.) |
|---|---|
| C | 45·17 |
| H | 3·70 |
| Cl | 25·13 |

*Acetyl-barbaloin.*

| | (average.) |
|---|---|
| C | 58·63 |
| H | 5·41 |

*Zanaloin.*
(*dried in vacuo.*)

| | Tilden (average.) | Flückiger. |
|---|---|---|
| C | 59·49 | 59·2 |
| H | 5·80 | 5·9 |

*Bromozanaloin.*

| | Tilden.* | Tilden. |
|---|---|---|
| C | 34·67 | 34.05 |
| H | 2·95 | 2·65 |
| Br | 42·09 | 43·06 |

*Chlorozanaloin.*

| | Tilden (1875.) |
|---|---|
| C | —— |
| H | —— |
| Cl | 25·04 |

*Acetyl-zanaloin.*

| | (average.) |
|---|---|
| C | 58·84 |
| H | 5·38 |

* Both prepared at the same time and in the same way, by pouring bromine water into solution of the aloin.

A review of these numbers is sufficient in my opinion to convince anyone that it is impossible to distinguish by quantitative analysis the aloin of Barbadoes from that of Socotrine or Zanzibar aloes.

The only difficulty encountered in this table of results occurs in Stenhouse's analysis of the brominated derivatives.

On referring to his paper, however, I found that this compound had been prepared by adding the bromine water to the solution of the aloin. Now the experiments I have described in a preceding paragraph indicate, I think conclusively, that the substance obtained in this way is not pure, that it is in fact contaminated with aloin, from which it differs so slightly as regards its solubility in spirit of wine that the two substances cannot be completely separated by re-crystallization from that solvent. The only way of avoiding this contamination is to bring the aloin at once into contact with an excess of bromine, and this is best effected by reversing the process of precipitation by pouring the solution of aloin into the bromine water.

The conclusion, then, to which these experiments lead us is that these two crystalline bodies which I have called barbaloin and zanaloin are isomeric when in the anhydrous state. This conclusion is supported by all that we know of their botanical origin and physical characteristics, as well as their chemical properties. The two bodies resemble each other in appearance and in taste, and though zanaloin is slightly paler in color and a little more soluble, there is no marked difference in these respects. It may be observed, however, that zanaloin and its derivatives contain a larger amount of water of crystallization than barbaloin. As to qualitative tests there is but one in the action of which any differences can be perceived in operating on the two bodies, and that is nitric acid. With barbaloin, nitric acid gives an instant coloration which fades quickly to orange red. Zanaloin, on the contrary, moistened with the same liquid, gives no immediate coloration, but on the application of heat, an intense orange red is developed. They both give chrysammic acid under the prolonged action of nitric acid and both yield crystallizable chloro- and bromo- substitution derivatives which resemble each other very closely.

Socaloin is believed, and with great probability, to be identical with zanaloin. Zanzibar aloes is but a variety of socotrine, and the qualitative reactions of the two agree in every respect. But as yet no quantitative analyses of socaloin have been published.

Nataloin is evidently widely separated from the rest of these crystal-

line principles by its inferior solubility and especially by the circumstance that it yields no chrysammic acid nor definite chloro- or bromo-substitution derivatives.

Taking all these circumstances into consideration, I am unable to adopt the suggestion of Rochleder that these bodies constitute three successive terms of a homologous series. On the contrary, the analytical results obtained by different experiments indicate that barbaloin and zanaloin have the same composition. They must, therefore, be represented by the same formula. I propose for them both in the anhydrous state the symbols $C_{16}H_{18}O_7$, which, as will be seen by the annexed statement of percentages, agrees satisfactorily with all the analytical numbers. This, which is simpler than the formula hitherto received, is also conformable with the statement of Graebe and Liebermann that aloin yields anthracene or some closely allied hydrocarbon, perhaps methylanthracene, when heated with zinc.

| $C_{16}H_{20}O_7$ requires | $C_{16}H_{18}O_7$ requires | $C_{16}H_{16}O_7$ requires |
|---|---|---|
| C 50·25 | C 59·62 | C 60·00 |
| H 6·17 | H 5·59 | H 5·00 |

Bromo-derivative

$C_{16}H_{15}Br_3O_7$ requires

C 34·34
H 2·68
Br 42·93

Chloro-derivative

$C_{16}H_{15}Cl_3O_7$ requires

C 45·12
H 3·52
Cl 25·03

Acetyl-derivative

$B_{16}H_{15}(C_2H_3O)_3O_7$ requires

C 58·92
H 5·35

This formula, $C_{16}H_{18}O_7$, has been proposed by Rochleder for nataloin and it agrees closely with the results of my analyses of that substance, but the discussion of this part of the question must be deferred till further experimental results have been accumulated.—*Phar. Jour. and Trans.*, 1875, Sept. 11.

## JAPANESE PEPPERMINT CAMPHOR.*

BY G. H. BECKETT AND C. R. ALDER WRIGHT, D. SC.
Lecturer on Chemistry in St. Mary's Hospital Medical School.

Through the kindness of Mr. John Moss (Messrs. Corbyn and Co.) we have received a liberal supply of well crystallized Japanese peppermint camphor, and also of the liquid camphor oil simultaneously imported, the crystals being, in fact, the stearopten of the oil, separated from the liquid constituents by standing and pressure. This crystalline camphor has been already examined by Oppenheim (*Chem. Soc. Journ.* [1], xv., 24), who found that it contains more hydrogen than ordinary camphor, being indicated by the formula $C_{10}H_{20}O$—ordinary camphor being $C_{10}H_{16}O$—and that it is a kind of monatomic alcohol, *menthylic alcohol*, forming a hydrocarbon, *menthene*, $C_{10}H_{18}$, by the action of dehydrating agents, just as ordinary alcohol gives rise to ethylene.

This alcohol, being homologous with allylic alcohol, is manifestly more closely connected with the "fatty" or methylic alcohol series than with benzene derivatives; whilst the hydrocarbon menthene is just midway between the 10-carbon marsh gas homologue and cymene, thus:

| | |
|---|---|
| Decane, | $C_{10}H_{22}$ |
| Decylene, | $C_{10}H_{20}$ |
| Menthene, | $C_{10}H_{18}$ |
| Terpenes, | $C_{10}H_{16}$ |
| Cymene, | $C_{10}H_{14}$ |

It is, therefore, of some interest to see whether cymene is obtainable from menthene, and hence from menthylic alcohol, by simple treatment —*i. e.*, whether these substances are not connecting links between the fatty and aromatic series.

Oppenheim found the melting point of menthylic alcohol to be 36°; the crystals sent to us were found by Mr. Moss to melt at 39°, re-solidifying at 37°.5; on dissolving them in hot dilute alcohol no crystals deposited on cooling, but an oily fluid separated; this gradually became crystalline as the traces of alcohol retained by it evaporated, and after exposure to air for several weeks, was found to melt at 42°, and to boil at 212° (corrected—Oppenheim found 210° and Mr. Moss 215°): on analysis numbers were obtained agreeing sharply with the formula $C_{10}H_{20}O$.

The crystals were heated with about their own weight of zinc chlo-

* Read before the British Pharmaceutical Conference.

ride, the distillate (separated from the aqueous portion) being then poured back and cohobated with the zinc chloride for some hours; but little resin was thus formed, almost the whole being transformed into menthene boiling at 164·5 to 165°·5 (corrected) after cohobation with sodium (Oppenheim gives 163° as the B. P. of menthene); on analysis numbers were obtained agreeing well with the formula $C_{10}H_{18}$.

Oppenheim has already shown that by the addition of *two* equivalents of bromine to menthene a dibromide is formed which readily splits up into a terpene and hydrobromic acid, thus—

$$C_{10}H_{18}Br_2 = 2\,HBr + C_{10}H_{16}$$

and hence has established a connection between the terpene series of hydrocarbons and derivatives of ethylene homologues such as $C_{10}H_{18}Br_2$ (derived from $C_{10}H_{20}$ by substitution of $H_2$ of $Br_2$); since terpenes have been shown to be cymene derivatives, it seems probable that menthene is really connected with cymene; that this is so we have found to be the case by combining *four* equivalents of bromine with menthene, and heating the resulting oily tetra-bromide of menthene, or *tetra bromo decane*, when it breaks up into cymene and hydrobromic acid, thus—

$$C_{10}H_{18}Br_4 = 4HBr + C_{10}H_{14}$$

Hence it is manifest that menthene is strictly intermediate between the paraffin and the benzene homologous hydrocarbons, as it is between the ethlene series and the terpenes; and that it is possible to pass from the paraffin series to the benzene series *by one single simple reaction.*

The cymene thus obtained from menthene was found to be identical with ordinary cymene obtainable from camphor terpene, and various constituents of essential oils as described in the "Year-Book," 1863, pp. 518, 519; 1864, 631.

The liquid Japanese camphor oil, received from Mr. Moss, appeared to be a solution of the solid camphor $C_{10}H_{20}O$ in a permanently fluid substance containing less hydrogen, probably indicated by the formula $C_{10}H_{18}O$, and isomeric or identical with the substance of that composition contained in citronella oil. On fractional distillation, a little came over below 205°; the principal portion, however, distilled between 210° and 215°, and gave on analysis, numbers agreeing with a mixture of $C_{10}H_{20}O$ and $C_{10}H_{18}O$; a little came over at higher temperature still, whilst a small portion was not volatile even at 300°.

On heating the distillate at 210°—215° with zinc chloride, menthene was obtained boiling at 165° together with resinoid substances de-

rived from the $C_{10}H_{18}O$ constituent by polymerization and partial removal of the elements of water. It was not found practicable to cause the separation of crystals of camphor from the liquid oil by cooling in a freezing mixture, even when a crystal of the solid was dropped in and the whole kept at a low temperature for several hours; it does not, therefore, follow, however, that the $C_{10}H_{20}O$ constituent present in the liquid oil is not the solid camphor melting (when pure) at 42°, as a minute quantity of some permanent liquid, *e. g.* alcohol, wholly prevents the solid camphor from crystallizing when once liquefied; it is, however, by no means impossible that the liquid oil contains an isomeric modification liquid at the ordinary temperature.—*Phar. Jour. and Trans.*, Sept. 25.

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## REPORT ON THE DEVELOPMENT OF THE CHEMICAL ARTS DURING THE LAST TEN YEARS.*

BY DR. A. W. HOFMANN.

(Continued from page 513.)

The more we must hope that the manufacture of oxygen may be saved by the metallurgical demand. In medicine it has not found any general application. According to Pereira,† in spite of certain modern eulogies of the healing power of oxygen, there is, in the opinion o competent judges,‡ little to be said on the subject. We quote the passage.

"Soon after the discovery of oxygen gas, a strong feeling arose in favor of its medicinal application. Various diseases, *e.g.*, scurvy, were ascribed to a deficiency of it in the system, and it was according employed in many cases, and, as was at first declared, with brilliant results. In England, it was tried by Beddoes and Hill.‖ The latter declares that he found it useful in asthma, weakness, ulcers, gangrene, white swellings, and scrofulous affections of the bones. These views have been again abandoned, both on chemical and physiological grounds. In

* "Berichte über die Entwickelung der Chemischen Industrie während des letzten Jahrzehends."

† Pereira, "Heilmittel Lehre;" Buchheim's German edition, vol. i, p. 217

‡ Verbal communication from Professor Oscar Liebreich.

‖ "Considerations of the Use of Facticious Air and on the Manner of Obtaining them in Large Quantities," by F. Beddoes and J. Watt; Bristol, 1794–95. It is well known that, in 1798, a Pneumatic Institute was founded at Bristol, in which the medicinal properties of gases were examined, and where Humphry Davy discovered the effects of nitrous oxide.

asphyxia, from want of air, or from the inspiration of pernicious gases, oxygen gas may be inhaled with advantage. From the same reasons, it has been recommended in spasmodic asthma attended with danger of suffocation. Still it is, at the best, a mere palliative, and can by no means prevent renewed attacks. If we consider, in the application of oxygen gas, its physical action, as already discussed, we shall readily conclude that the inspiration of oxygen is in most cases useless, and that but little—and only in few cases—can be expected from its therapeutical application."

Nevertheless, an "Inhalatorium," recently opened in Berlin, sells oxygen at 6 silver groschen per cubic foot (20 marks per cubic metre), and oxygenated water at 1½ silver groschen per bottle.* As water at 0° does not absorb 4 per cent. of its volume, a half-litre bottle does not contain 20 c.c. or 0·0017 grm. of the gas! To expect any effect from such a dose appears irrational.

Just as concentrated food is recommended for travelers, so oxygen has been proposed to be inhaled by those who climb the highest summits of mountains or attain altitudes in balloons where the rarefaction of the atmosphere occasions dangerous affections.† P. Bert ‡ has exposed himself and others, in a suitable apparatus, to dilutions of air far surpassing that encountered at the greatest altitudes hitherto reached. The difficulty of breathing and the symptoms of suffocation which appeared when the barometer indicated 300 to 250 m.m. were relieved, according to his account, by a single inspiration of pure oxygen. Dilution of oxygen with atmospheric air was found more advantageous than the pure gas; and on a balloon voyage which Croce-Spinelli and Sivel undertook from Paris, March 22d, 1874, they took with them mixtures of 45 and 75 per cent. of oxygen (and therefore 55 and 25 of nitrogen). With the aid of this mixture they were able to conduct valuable physical observations at leisure, and without bodily inconvenience, at the height of more than 6,000 metres; and although Glaisher succeeded, without this auxiliary, in attaining still greater heights, it cannot be denied that oxygen gas affords the means of exploring atmospheric regions hitherto unknown.

The physiological applications of oxygen lead us naturally to that modification which bears the name of ozone, with which, in the outset, high therapeutical hopes were connected.

* Eight silver groschen=four-fifths of a shilling sterling.=19 cents.

† Fonvielle, "La Science en Ballon;" Paris, 1869.

‡ Bert, "Comptes Rendus," 1874, p. 911.

The discovery made known by Schönbein, according to which the peculiar phosphorous odor accompanying the electrolysis of water, was due to the evolution of oxygen in a state possessing heightened oxidizing properties, was received with great expectations, both in medicine and arts. Schönbein named this oxidizing principle ozone (from ὀζειν, to smell), and he perceived its evolution, as Van Marum had already done in 1785, at least, as far as the odor is concerned, near the conductor of an electric machine when in action. He discovered subsequently that it was produced also during the slow combustion of phosphorus, and that it was present in the atmosphere in very preceptible traces. Observations of its occurrence increased very rapidly. Schönbein and others, found that the peroxides of silver, barium and hydrogen, in contact with sulphuric acid, evolved oxygen more or less strongly ozonized, the same property belonging also to the manganate, permanganate and (according to Rammelsberg) the periodate of potash. The agitation of air with mercury, or with the precious metals in a state of fine division, or with powdered glass,* was also found to be a means of ozonization. The ethereal oils, especially oil of turpentine, display this property in a high degree. Ozone was detected in the air current from a furnace-blast and in the oxygen expired by plants.

The means for its detection, in addition to the fact that 1 part of ozone imparts its peculiar odor to 500,000 parts of air, were found in the following reactions:

Ozone liberates iodine from iodide of potassium, iodic acid and potassic peroxide being simultaneously formed, and the solution, after the removal of the iodine, has an alkaline reaction. The presence of the free iodine is easily demonstrated by means of moist starch-paper, and the potash, or potassium peroxide, by litmus. Ozone bleaches indigo and colors freshly-prepared tincture of guaiacum a deep blue, turns paper brown which is saturated with salts of manganous oxide or thallous salts by the formation of higher oxides, oxidizes mercury at ordinary temperatures, and converts silver into black silver peroxide. Paper saturated with thallous oxide and exposed to ozone blues tincture of guaiacum, potassium-iodide and starch before it turns brown. It was sometimes forgotten that the reactions with indigo, guaiacum and iodide of potassium and starch are produced also by chlorine, nitrous and hyponitrous acid, and hence phenomena have been ascribed to ozone which were really due to one or other of these bodies.

* Andrew's "Nature," 1875, p. 365.

Concerning the nature of ozone, opinion fluctuated for a long time. More than one eminent chemist held that it contained hydrogen. Marignac and De la Rive maintaimed the opposite view, which was finally demonstrated by Soret in 1863. The reason of the difference between ozone and ordinary oxygen became gradually intelligible. The first step was furnished by the observation of Andrews and Tait, that ozonized oxygen, if heated to 270°, was converted into common oxygen, increasing at the same time in volume, and that ordinary oxygen, if ozonized by silent electric discharge, decreased in volume. This decrease in bulk corresponds to the quantity of the active oxygen absorbed by potassium-iodide, so that if the volume, on ozonization, is decreased by $\frac{1}{n}$, then $\frac{1}{n}$ of the ozonized oxygen is absorbed by solution of potassium-iodide. Ozone, therefore, appears indubitably as condensed oxygen. Odling's hypothesis, that this condensation amounts to one-third, and that the molecule of ozone is larger by the half than that of ordinary oxygen, its molecular weight being $O_3 = 48$, that of common ozygen being $O_2 = 32$, was approximately proved by Soret in 1865, and decidedly demonstrated by Brodie in 1871.* Soret added the discovery that ethereal oils, especially oils of turpentine and of cinnamon, absorbed the whole amount of the ozone formed; consequently, not $\frac{1}{n}$, but $\frac{3}{n}$.

Ozone has never been obtained in a state of purity.

All chemical methods, as well as the electrolysis of water, yield it only very sparingly, since not merely reducing agents, but even oxidisers, all super-oxides for instance, re convert ozone into ordinary oxygen. The example of barium super-oxide shows this in the following equation :—$O_3+BaO_2=2O_2+BaO$.

Connections of cork and caoutchouc cannot be used in an ozone apparatus, on account of their oxidisability. The electric spark has also a destructive action upon ozone. The best procedure for its preparation is, therefore, silent discharge with the aid of a Ruhmkorff's apparatus in induction-tubes, filled with oxygen. The greatest contraction which Andrews and Tait observed in oxygen thus treated was one

* Brodie, "Proceedings of the Royal Society," vol. xx, p. 472, 1872; Odling, "History of Ozone."—*Proceedings of the Royal Institution*, 1872.

twelfth. This, as has been shown above, amounts to the transformation of one-fourth of the oxygen present into ozone.

An instrument of this kind, of a simple construction, was described by Werner Siemens* in 1857. Brodie† has recently defended the claims of this eminent physicist in opposition to supposed recent inventors, especially Houzeau. Wills‡ gave the instrument a less fragile form, and with this modification it has been recently introduced into trade by the English mechanicians, Tisley and Spiller.‖ It has the advantage that it can be cooled by the passage of a current of water. As Siemens recommended the application of the thinnest possible glass, it remains to be decided whether the more solid form may not involve a reduction of the yield of ozone.

Siemen's instrument consists essentially of two concentric tubes of glass, the inner tube being lined with tinfoil within, and the exterior coated with the same material without. The inner tube is closed at one end, and is sealed to the outer tube in such a manner that an interval remains between them. The outer tube is drawn out at one end to a thin junction piece, and a similar one is fused to it at the other end. Oxygen circulates in the interval. If the wire ends of the Ruhmkorff's apparatus are brought in contact with the tinfoil coating of the tubes, the intervening space becomes luminous, and the oxygen present is ozonized. Rumine§ in England, and Löw in France,¶ patented, in 1872, a process for obtaining ozone by blowing cold air into the Bunsen flame. There is no information as to the results of this process.

A patent obtained in England, and specified far from clearly, for obtaining ozone by boiling seaweed,** may be mentioned as a curiosity, and also the credulity with which ozone-baths, prepared in this manner, find a ready sale, in spite of, or perhaps rather on account of, their high price. It appears at any rate that an industrial method of obtaining ozone is hitherto an unfulfilled desideratum.

Only the highest branch of industry, that in which justly no price is considered too high, as its object is health, to wit, medicine, has

* Siemens, "Pogg. Ann.," cii., 120.
† Brodie, "Nature," Feb. 18, 1874.
‡ Wills, "Ber. Chem. Ges.," vi., 769.
‖ "Nature," viii. (1873) 148.
§ Rumine, "Ber. Chem. Gesell.," v., 123.
¶ Löw, "Ber. Chem. Gesell.," v., 740.
** "Berl. Chem. Gessel.," v., 543.

found the present methods sufficient to allow of the application of ozone. These endeavors were founded on the same observation first published by Schönbein, and subsequently placed beyond the reach of doubt by Andrews* that the air of towns, and even that of well-ventilated rooms in the country contains no ozone, whilst it can always be discovered in the open air of the country, and the certainly unproved conjecture of Schönbein as to the connection between epidemics and a deficiency of ozone.

Latterly Lënder has come forward as the advocate of the medical application and efficacy of ozone, which he recommends both as ozonized air and ozonized water in tuberculosis, rheumatism of the joints, glaucoma, asthma, gout, &c.† That his exertions have not met with the approval of the profession appears from a discussion of the Berlin Medical Society, Oct. 29, 1873, held under the presidency of Dr. Von Langenbeck.‡ Here the use of ozone was defended by Lënder alone, and met with zealous opposition. O. Liebreich argued on this occasion that it was impossible to convey into the blood a body so unstable as ozone, which must be decomposed in the respiratory organs. Inhalations of ozone must, therefore, be merely inhalations of pure oxygen, whilst the disinfection of sick chambers may be effected by simpler and better means. Nevertheless, it is necessary to mention here the observations of Schöne‖ and Houzeau § that after working with ozone, its peculiar odor adheres to the hands for some time, as well as to garments of flannel or other tissues. Its decomposition, therefore, appears not to be instantaneous. That the physiological action of strongly ozonised oxygen is very important, appears from the recent experiments of Dewar and MacKendrick.¶ Oxygen ozonised by induction, and containing at most 10 per cent of ozone, killed small animals which were allowed to inhale it, such as rabbits, mice and small birds, the two latter in 20 minutes. Respiration was rendered slower, the pulse was enfeebled, and the blood in all parts of the body was rendered venous. This remarkable phenomenon is considered by the observers as due to the high specific gravity of ozone (24), which ex-

* Andrews, "Nature," 1874, p. 366.
† Lënder, "Goschen's Deutsche Klinik," 1872, 1873.
‡ "Klinische Wochenschrift," 1873, 588, 589.
‖ Schöne, "Berl. Chem. Ges.," 1873, 1226.
§ Houzeau, "Ann. Chim. Phys." (4), xxvii, 16.
¶ Dewar and MacKendrick, "R. Soc. Edinb. Proc.," Session 1873, 1874.

ceeds that of carbonic acid (22), and thus retards the diffusion of the latter out of the blood. The irritant action of ozone upon the mucous membrane and its destructive effect upon tissues are recognized both by these observers and by earlier authorities. Redfern considered in 1857 that in his experiments oxygen containing 1·240th of ozone proved fatal to small animals in 30 seconds, producing congestion and emphysema of the lungs after enlargement of the right ventricle.*

Lënder has established an ozone manufactory for medicinal purposes. It is announced that ozone inhalations may be had at about 7½d. per cubic foot, or £1 per cubic metre. The method of preparation, and the strength in ozone, are not stated. Ozonized water, according to the degree of concentration, costs from 6d. to 1s. per bottle. This ozonized water was very carefully tested by Carius† with the unfavorable result that in 1,000 grms., 0 0087 to 0·0095 grm., or less than 1-1000th per cent. of ozone, was present. Chlorine and hypochlorous acid were not detected. On the other hand, Behrens and Jacobsen‡ say that nothing but hypochlorous acid is found in commercial ozone-water. According to the experiments of Carius, the absorption coefficient of ozone in water is so small that the above-mentioned figures border very closely upon the highest possible quantity.

How great would be the influence of a cheap source of ozone upon manufactures appears at once from the fact that in the nascent state this body oxidizes nitrogen to nitric acid. The presence of the latter body in thunder-rain has long ago been found to result from this circumstance. The manufacture of ozone would, therefore, involve nothing less than the synthesis of this important mineral acid, hitherto only procured from nitre.

That in grass-bleaching and in disinfection by means of ethereal oils we have from time immemorial made use of ozone—generated in the one case by the growth of grass, and in the other by the hydrocarbons—can only serve to intensify our longing for the technical production of ozone. Upon such a process depends the method of bleaching ivory, as it has been conducted since 1850 in Meyer's walking-stick manufactory at Hamburg, and subsequently at other places. The ivory is immersed for weeks in photogen, or other volatile oils,

* Andrews, "Nature," 1874, 366.

† Carius, "Ber Chem Ges.," v., 520, and vi., 806.

‡ Behrens and Jacobsen, "Vierteljahrschrift f. Pr. Pharm. von Wittstein," xxii. 230, 1873.

exposed to strong sunshine and to air, whereby the latter is ozonized and bleaches.

The first patent for the application of ozone was recently granted in England. In oder to form acetic acid from alcohol without fermentation, the inventors * obtain ozone by blowing air through a flame and bringing it in contact with a current of alcohol. A practical verification of the procedure has not been furnished. —*Chem. News*, Aug. 13–Sept. 17.

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## POTASSIUM CYANATE AND UREA.

BY CHICHESTER A. BELL, M. B.

Having on several occasions lately been in want of small quantities of potassium cyanate, a salt not readily procurable in the shops, the many inconveniences attending its preparation by the usual processes, as well as the varying quantities obtainable, induced me to seek for some more convenient and equally productive method. As the result of a few experiments in this direction, I venture to suggest the following modification of Liebig's well-known process, which will be found rapid and easy of execution, requiring no previous acquaintance with its details, and in the end economical both of time and material: 4 parts of perfectly dried and finely powdered potassium ferrocyanide are intimately mixed with three parts of dry and pulverized potassium bichromate. A small quantity of this mixture is placed in a porcelain or iron dish, the temperature of which is then raised until a tender-like combustion takes place, and the mixture blackens, which happens considerably below a red heat. The rest of the mixture is then thrown in by small portions at a time, each successive portion being allowed to blacken completely before it is covered by the next. This is necessary, inasmuch as if air be excluded during the combustion, a considerable quantity of potassium cyanide will be found unoxidized. When all the mixture has been thus gradually added, the lamp is removed and the dish allowed to cool completely. The result of the reaction, which occupies but a few minutes, even for a considerable quantity of material, is a porous, friable mass, from which the cyanate may be extracted with the greatest ease, in the usual manner, by boiling alcohol. Methylated spirit which has been freed from a part of its water by standing over potassium carbonate, and rectified, answers the purpose admirably. In order to diminish as much as possible the loss from conversion of

* Turner and Vanderpool, *Ber. Chem. Ces.*, vi., 1553.

the cyanates into carbonate during boiling, and also to economize alcohol, it is advisable to add to the latter at each boiling only about as much of the mixture as can be thoroughly exhausted by it. The filtration takes place so rapidly that it is not necessary to employ a hot-water funnel, and the crystallization of the cyanate may be hastened by immersing the vessel containing its alcoholic solution in cold water. The mother-liquor may be used an indefinite number of times in subsequent boilings. In a favorable experiment the resulting cyanate, equal to about 42 per cent. of the dried ferrocyanide, contained less than 1 per cent. of impurity.

To obtain the insoluble cyanates, lead, silver, &c., it is only necessary to exhaust the black mass with very cold water, to treat the filtered solution with barium nitrate, in order to remove the chromate and any unaltered ferrocyanide, and finally to precipitate with a nitrate of the metal.

From the above aqueous solution urea may obviously be prepared by the addition to it of 4¼ parts of ammonium sulphate, evaporation to dryness, extraction with boiling alcohol, &c. Even from so small a quantity as one ounce of the dried ferrocyanide it is thus possible to obtain, in a short time and with little trouble, about 25 per cent. pure urea. In this form the experiment would furnish a capital exercise for students.

I may here remark that for the purification of urea, on the small scale, amylic alcohol will be found a much more convenient crystallizing medium than ordinary alcohol.—*Chem. News* [Lond.], Aug. 27, 1875.

*Stevens's Hospital Laboratory, Dublin.*

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## ON ACETUM SCILLÆ, B.P.

BY E. GREGORY.

About a year since, taking up in an idle moment an old copy of the London *Pharmaceutical Journal*, I read in answer to an inquiring correspondent a recommendation to prepare acetum scillæ, according to the formula of the "British Pharmacopœia," "carefully avoiding, however, the directions to add one and a half fluidounces of proof spirit at the end of the process." On theoretical grounds I had long omitted the spirits, but the strangeness of this advice, proceeding from such a source, determined me to open the whole question, and endeavor to

satisfy myself by experiment that I had taken a correct view. Accordingly, on the 4th of November, 1874, four samples of acet. scillæ were put into separate four ounce vials, and tightly corked.

No. 1 same as B. P., but no spirit.
" 2 " " but contained spirit.
" 3 " " no spirit.
" 4 " " contained spirit.

Nos. 1 and 2 were placed on the inside sill of a window with a western aspect. These were exposed during the winter to a temperature of from about 28° to 65°, and in summer the direct rays of an afternoon sun would sometimes raise the atmosphere around them to about 90°, or possibly 95°, Fahrenheit. Nos. 3 and 4 were placed on a shelf near a stove; and here the temperature was pretty equable, ranging about 70°, and sometimes in summer going a little over 80°.

When put in their respective positions, the four samples had the following appearance. All had been filtered through paper, and had the odor peculiar to acet. scillæ.

No. 1 was perfectly clear.
" 2 " a little cloudy.
" 3 " perfectly clear.
" 4 " a little cloudy.

It is quite certain that spirit does not improve the appearance of this preparation when freshly made, since Nos. 1 and 3, containing no spirit, were clear and bright, whilst Nos. 2 and 4, containing spirit, were cloudy.

On November 16th the samples were again examined, and presented the following appearance;

No. 1 clear, no sediment.
" 2 cloudy, slight sediment.
" 3 clear, no sediment.
" 4 very cloudy, heavy sediment.

Another examination was made December 3d, with the following result:

No. 1 clear, no sediment.
" 2 clear, slight sediment.
" 3 clear, no sediment.
" 4 clear, heavy sediment.

The taste at this period showed No. 4 to be slightly "musty," whilst No. 3 seemed deficient in acidity, but I think this last must have been fancy.

From this date the samples were occasionally examined in a superficial manner, but through extreme pressure of business, results were not particularly noted. It is enough to say that there was a gradual deterioration in all the samples.

On the 20th of August, 1875, all were finally examined. Nos. 1, 2 and 4 were unmistakably spoiled, whilst No. 3 was scarcely fit to use, but would pass muster if not examined too critically. It was decidedly less decomposed than the other three. There was a distinct sediment in all, but much the heaviestin No. 4; the rest seemed about equal.

All the samples were then examined volumetrically, for the purpose of determining their relative acidity. Two drachms of No. 1, diluted with six drachms of distilled water, required 53 minims of the volumetric solution of soda, B. P., to neutralize it. No. 2 and No. 4 were equally strong in acid, whilst the same quantity of No. 3, diluted with a like quantity of water, required 68 minims of soda sol. to neutralize it. I cannot be quite certain as to the exactness of my acidimetry, since my burette and measuring flasks are of my own construction, from glass tubing and common vials; but as the same solution and apparatus were used throughout, the comparative results will be correct. The volumetric estimates were duplicated to ensure accuracy, and gave very nearly the same results each time.

I would draw the conclusion, from these experiments, that the proof-spirit ordered to be added to acet. scillæ by the "British Pharmacopœia," is worse than useless, since it impairs the beauty of the sample and renders it less able to resist the inroads of decomposition; and also, that the preparation is best kept in situations having an equable temperature, and not exposed to very strong light. Those samples have suffered most in my hands that have been exposed to the greatest extremes of temperature.—*Canadian Pharm. Jour.*, Oct., 1875.

# VARIETIES.

IODOFORM CRAYONS.—According to *The Doctor*, these cylinders are made by mixing one and a half drachms of iodoform with seven and a half grains of powdered gum acacia, and sufficient mucilage to form a mass. This quantity may be divided into ten pencils, each about an inch long. They should be allowed to dry in the

air for twenty-four hours; but, after this, should be preserved in a dark and air-tight bottle, as prolonged exposure is followed by disintegration.—*Can. Phar. Journ.*, Oct., 1875.

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THE CHEAPER CINCHONA ALKALOIDS ("The Chicago Medical Journal").—Dr. James S. Whitmire has for several years been employing in his practice the sulphates of cinchonia, quinidia and cinchonidia, and even the residue—chinoidine. Cinchonia he has found unsuitable for use as an antiperiodic or antipyretic, because of its tendency to nauseate the stomach; but in smaller doses, in connection with the tincture of iron, he has found it useful as a general tonic. Forty grains of quinidia seemed to be equivalent to about twenty-five of quinia.

Dr. Whitmire is disposed to attribute to cinchonidia very nearly, if not quite, an equal therapeutic value with that of quinia, and in about the same doses, while its commercial value is only one-third that of the latter. Chinoidine he employs as a powder in three to four grain doses, after each meal, alternating it with Fowler's solution, and he has been very successful through its means in preventing the recurrence of intermittents.

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SALT WATER SOAP, according to a French patent, consists of resin soap and glue. 40 parts oil or grease and 10 parts resin are made into soap with an excess of alkali, then add 40 parts glue dissolved in sufficient water, containing one pint oxalic acid. Stir well at a temperature of about 135° F. A soft soap is obtained by using patassa.—*Ber. d. d. Chem. Ges*

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SAFRANIN.—Prof. Boettger calls attention to a beautiful display of colors, which arises if one or two drops of conc. sulphuric acid are poured on a few minute particles of safranin in a porcelain capsule or tile. By stirring with a glass rod a splendid blue color appears, which is converted into emerald green by adding one or two drops of water. By thus alternating the addition of sulphuric acid and water most of the spectral colors will be produced.—*Buchn. N. Rep.*, 1874.

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DIABETES, FORMATION OF SUGAR.—Mialhe has found that the normal amount of alkalies is greatly reduced in the blood of diabetics. He says the starch gets converted into sugar as well in healthy persons as in those affected with diabetes; with this difference, however, that the formed sugar is again decomposed, (oxidized) chiefly by means of the alkalies, in healthy persons, while in diabetics this oxidation is not possible through want of a sufficient amount of alkalies.—*Cherm Centralbl.*, 1874.

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TASTELESS PHOSPHATE OF IRON.—Dietl (Innsbruck, Tyrol) precipitates chloride of iron with albumen, and dissolves the precipitate in diluted phosphoric acid. The liquor is without color, and has no inkish taste —*Hygiea* 1874, *Oct.* H. M. W.

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NOTE ON APOMORPHIA.—M. Oberlin.—The reactions are given as follows:—

1st. With alcohol it first preserves its gray color, then gradually passes to green, and finally assumes an emerald color, which is quite stable.

2d. With ether, benzin and chloroform no perceptible change.

3d. With nitric acid it strikes a reddish-violet color, which remains for several hours.

4th. Frohde's reagent (sodium molybdate with concentrated sulphuric acid) gives an intensely green coloration, which after a time has a slight violet cast.

5th. With ferric chloride a pink color is obtained.

An aqueous solution of iodic acid (1 : 10) gives garnet-red. An alcoholic solution of the same acid, a red —*Amer. Chem.*, Sept., from *Jour. de Pharm. et de Chim.*

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PEROXIDE OF IRON AS A GENERATOR OF NITRIC ACID, AND ON THE ORIGIN OF NITRE IN SOME EXPERIMENTS OF CLOEZ.—Dr. Leone Pesci.—The author's results are: that sesquioxide of iron is capable of nitrifying ammonia; that, as Prof. Selmi holds, the first step in nitrification is probably the formation of nitrous acid; that this oxidation is affected by the sesquioxide of iron, not as a porous body, condensing oxygen from the air, but giving up oxygen of its own as proved by its reduction out of contact with the air; if exposed to the air the sesquioxide is not reduced, since the oxygen withdrawn is replaced from the atmosphere. This explains the fertilizing action of compounds containing peroxide of iron. Hence, also, ochraceous limes are preferable for artificial nitre-beds. Lastly, in the experiment of Cloëz, ammonia was evolved, to the oxidation of which rather than to the direct oxidation of atmospheric nitrogen must be ascribed the formation of nitric acid.—*Chem. News*, Sept. 24, from *Gaz. Chim Ital.*

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OLEANDRIN AND SO-CALLED PSEUDOCURARIN.—Dr. Ciro Bettelli.—Cattle having been poisoned by eating oleander-leaves, the author made an investigation of oleandrin and pseudocurarin, two poisonous principles present. Oleandrin with concentrated sulphuric acid gives a splendid orange color, which on the application of heat passes into a violet-red. With sulphuric acid and bichromate of potash it gives first an orange, then a yellowish green, and finally an emerald green, which remains for some time. With sulphuric acid and ceric oxide it gives an orange which passes into violet.—*Ibid.*, from *ibid.*

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ON ARBUTIN.—Hlasiwetz and Habermann have made a research upon arbutin, a glucoside extracted by Kawalier from the *Arctostaphylos uva-ursi*, or bearberry. Its discoverer observed that it was easily split into glucose and a body which he called arctuvin, but which Strecker asserted to be hydroquinone. The authors find, however, that the body thus obtained is not pure hydroquinone, but is a mixture of this and its methyl derivative, methyl-hydroquinone $C_6H_4\begin{cases}OCH_3\\OH\end{cases}$ isomeric with saligenin $C_6H_4\begin{cases}CH_2OH\\OH\end{cases}$. Hence they assign to arbutin the formula $C_{25}H_{34}O_{14}$ and express its splitting by ferments, as follows:

$$C_{25}H_{34}O_{14}+(H_2O)_2 = C_6H_6O_2 + C_7H_8O_2 + (C_6H_{12}O_6)_2$$

Arbutin. Water. Hydroquinone. Methyl-hydroquinone. Glucose.

One hundred parts of arbutin yield 19·7 hydroquinone, 22·5 methyl-hydroquinone and 64·7 sugar.—*Liebig's Annalen*, clxxvii, 334, June, 1875.—*Amer. Jour. of Science and Arts*, October, 1875.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, ON WEIGHTS AND MEASURES.—The special committee of this association, to which this subject was referred, report upon the steps taken the past year for the establishment and perpetuation of the basic units of the metric system, and the results of the conference of delegates from twenty-one nations. The United States was represented by Prof. Joseph Henry, of the Smithsonian Institute, and Julius G. Hilyard, of the Coast Survey (now President of the association.) The original standard meter and kilogram were adopted, and steps taken for authentic reproduction of them for distribution, and for comparison with other standards of dimension or quantity. The report comments upon and lauds the co-operation of our executive government in this great effort for universal civilization, and asks from all scientific bodies an expression of opinion to urge upon Congress the monetary aid desirable to meet the national share of the expenses; estimating the same at $12,000 original appropriation, with about $1,000 per annum subsequently. The committee say: "It is to be considered, that this is not designed merely to advance the interests of the metric system of weights and measures, or to serve as a means of promoting the extension of that system. The design is higher than that. To secure the universal adoption of the metric system, would be undoubtedly to confer an immense and incalculable benefit upon the human race; but it would be a benefit felt mainly in the increased facilities which it would afford to commerce, and to exactness in matters that concern the practical life of humanity. On the other hand, to secure that severe accuracy in standards of measurement which transcends all the wants of ordinary business affairs, yet which, in the present advanced state of science, is the absolutely indispensable condition of higher progress, is an object of interest to the investigators of nature immensely superior to anything which contemplates only the increase of the wealth of nations. * * * * * * * *"

A series of resolutions were offered by the committee, and were unanimously adopted by the association. Those of our readers who are interested especially in the metric system, will find this report in full in the proceedings of the association, which will shortly be published.—*The Journal of the Franklin Institute*, Oct., 1875.

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PROCESS OF GILDING.—Place in a plate leaf-gold, add a little honey, stir the two substances carefully together with a glass stopper, the lower end of which is very flat. Throw the resulting paste into a glass of water mixed with a little alcohol, wash it and leave it to settle. Decant the liquid, and wash the deposit again. Repeat the same operation until the result is a fine, pure and brilliant powder of gold. This powder, mixed with common salt and powdered cream of tartar and stirred up in water, serves for gilding.—*Chem. News*, July 16, 1875, from *Les Mondes*.

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ANOTHER METHOD FOR GILDING.—Boutet de Mouvel.—Dissolve in aqua regia 1 grm. of fine gold, previously rolled out very thin, in a porcelain capsule heated on the sand-bath and concentrated till it is the color of ox-blood. Add a half litre of distilled water, hot, in which have been dissolved 4 grms. of white cyanide of potassium. Stir with a glass rod, and filter the liquid through unsized paper. To gild with this liquid, it is heated a little above luke-warmness, and the articles to be gilt are immersed in it and supported upon a piece of very clean zinc.—*Ibid.*, from *ibid.*

COPPER ALLOY THAT WILL ADHERE TO GLASS.—The following alloy of copper will attach itself firmly to surfaces of metal, glass, or porcelain: Twenty to thirty parts of finely blended copper (made by reduction of oxide of copper with hydrogen or precipitation from solution of its sulphate with zinc) are made into a paste with oil of vitriol. To this seventy parts of mercury are added and well triturated. The acid is then washed out with boiling water and the compound allowed to cool. In ten or twelve hours it becomes sufficiently hard to receive a brilliant polish, and to scratch the surface of the gold. When heated, it is plastic, but does not contract on cooling.—*Amer. Gas-Light Jour.*, Oct. 2.

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UNINFLAMMABLE PRODUCTS.—It is well known that certain substances, notably phosphate of ammonia, incorporated in the fibers of tissues render the same incombustible, or, rather, admit of their burning very slowly and carbonizing with the production of flame. M. L'Abbe Mauran, says *La Nature*, has recently discovered that a mixture of borax, sulphate of soda, and boracic acid, in suitable proportions, while rendering cloth uninflammable, will also prevent any alteration of color, flexibility, or lasting qualities through the effect of combustion.—*Ibid.*

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POISONING BY BICHROMATE OF POTASSIUM.—A photographer in London recently drank a quantity of a strong solution of bichromate of potassium, having mistaken the jug for another which contained ale. The physician called in found him very prostrate, sweating profusely, and complaining of severe abdominal pains. He was also slightly purged, the evacuations being of a greenish-yellow color. The pupils were dilated, and the pulse very weak and fluttering Sulphate of zinc in water was administered two or three times, until vomiting and active purgation had been induced. Subsequently olive-oil was given him. He remained very weak for some time, and the stomach could only tolerate the mildest food.—*British Medical Journal, Amer. Drug. Circ.*, Oct.

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PICRIC ACID, obtained by the action of nitric acid upon carbolic acid, or, better, by treating crystallized phenic sulphate of sodium with nitric acid, is a yellow substance, crystallizing in foliated structure, difficultly soluble in cold, readily in hot water, and also soluble in alcohol. Picric acid has strong tinctorial properties, and has long been used as a dye for silk and woolens, to which it imparts a beautiful rich yellow, when mordanted with alum or tartar. In France, annually, some 80 to 100 tons of picric acid are prepared, but the bulk is used for the manufacture of picrate gunpowder. The ammonia salt of the trinitro-resylic acid is met with in the trade as Victoria yellow, as a dye material. Picric acid has lately been employed to give a bitter to beer. To detect this adulteration, Brunner recommends acidulating the beer with hydrochloric acid, and plunging therein a fragment of woolen thread, and digesting the same in a *bain marie*. After the thread is removed, it is heated with a solution of ammonia. The latter is filtered, evaporated in a *bain marie* to small volume, and a few drops of cyanide of potassium are added. The presence of 0·015 grain of picric acid in a pint of beer is determined by a red color being produced, due to the formation of isopurpurate of potash. The yield of

picric acid from the grass-tree resin of Australia, obtained in abundance from the stems of one or two species of *Xantorrhœa*, is considerable, as we stated in an article in our fourth volume, p. 122; and G. C. Wittstein has recently drawn attention to the neglect of this prolific source of supply. It is known in pharmacy under the name of "gum acroides,' and in the Australian colonies as "grass-tree gum," and "black boy gum." The advantages of using this substance for the manufacture of picric acid are two-fold. First, the material is cheap; second, the yield is large. About one hundred and fifty grains of the pulverized resin were placed in a beaker glass, and 750 grains crude nitric acid, of specific gravity 1·16, poured over it; the beaker glass was covered with a glass capsule and digested at a gentle heat. The mass soon swelled up, and a deep brown crust formed over the liquid. This crust needed to be broken up from time to time with a glass rod. After about three hours, nitrous fumes ceased to be evolved, and the mass was allowed to cool. The next day, he found the bottom of the beaker covered with a thick layer of yellow crystals. Above this, was a brownish-red tarry mass, which hung together in a lump. This was taken out and again digested with 375 grains nitric acid; but there was almost no action, at least no nitrious acid was formed, and no crystals were deposited from this second liquid on cooling, showing that it is unnecessary to treat the resinous mass with nitric acid a second time. In the present case, it was desirable to lose as little as possible of the product sought; hence, after the crystals that formed had been taken out, the second liquid was added to the mother liquor and evaporated to dryness. The first crystals were added and the adhering nitric acid driven off at 212° Fah. The total residue weighed 100 grains, almost two-thirds of the resin taken; it was yellow and crystalline, and contained nothing amorphous but single crystals of oxalic acid. The picric acid thus obtained, after recrystallizing to secure the oxalic acid, weighed seventy-five grains. Hence, the yield is fifty per cent. of the crude material.—*Jour. of App. Sci.* [Lond.], Oct. 1, 1875.

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Influence of Tannin on Vegetation.—By M. Mercadante.—When an aqueous extract of the dung of cows and goats is treated with tannin, nearly the whole of the bases and acids are rendered insoluble. Again, if the aqueous extract of dung is treated with hydrochloric acid, and the resulting precipitate, after washing, is dissolved in ammonia, and the ammoniacal solution saturated with calcium phosphate, tannin will precipitate from such a solution all the fertilizing ingredients except the phosphoric acid. Alkaline tannates act in the same way. The above is offered as an explanation of the sterility of soil containing tannin, especially as regards the leguminosæ and graminaceæ.—*Journ. Chem. Soc.*, September, 1875, from *Gazzetta Chimica Italiana*, iv, 484–486.

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The Two Sugars Obtained from Sugar of Milk.—By H. Fudakowski.—The author found, in 1866, that by the action of dilute acids on sugar of milk, two glucoses are formed, which both show right-handed polarisation. He is now continuing this research.—*Ibid.*, from *Deut. Chem. Ges. Ber.*, viii, 599.

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Isopropyl and Allyl Sulphocyanates.—By G. Gerlich.—During the preparation of a large quantity of mustard oil from potassium sulphocyanate and the

allyl iodide obtained from glycerin and phosphorus iodide, the author obtained a liquid specifically lighter than water, which, on analysis, was found to be isopropyl sulphocyanate, $C_4 H_7 SN$. It boiled at about 152°, and its density at 15° was 0·974. It gave the usual reactions of the alcoholic sulphocyanates when treated with sulphuric acid and with nascent hydrogen. It was doubtless derived from isopropyl iodide produced from the glycerin simultaneously with the allyl iodide.

In order satisfactorily to settle this point, and also, if possible, to obtain the corresponding allyl compound, allyl alcohol was prepared by Tollens and Henninger's method, and then converted into allyl bromide. On adding this to a cold alcoholic solution of potassium sulphocyanate, a reaction took place on standing, large quantities of potassium bromide being deposited, and allyl sulphocyanate produced. If, however, the solution was boiled, mustard-oil (allyl sulphocarbimide) was obtained. Allyl iodide yielded similar results. The author prefers to prepare the sulphocyanate by the action of allyl bromide on potassium sulphocyanate at 0°, and, after filtering off the potassium bromide, separating the new compound by the addition of ice-cold water; it may then be drawn off by a pipette. On attempting to distil allyl sulphocyanate, $C_4 H_5 SN$, the temperature at first rises rapidly to about 161°, and then gradually sinks, whilst a powerful odor of mustard-oil becomes apparent. In fact, on heating the liquid in a flask with an inverted condenser it is entirely converted into mustard-oil. The density of the sulphocyanate at 15° is 1·056. Unlike the mustard-oil, it gives no precipitate with an ammoniacal solution of silver nitrate, and when gently heated with alcoholic potash the liquid gives the sulphocyanate reaction with ferric chloride. Strong ammonia solution has no action on allyl sulphocyanate.—*Journ. Chem. Soc.*, Oct., 1875, from *Deut. Chem. Ges. Ber.*, viii, 650–653.

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On Ratanhin.—By B. Kreitmair.—Various supplies of ratanhy extract were experimented on, but only one yielded ratanhin, and that was one which had lain for some time in store.

The product obtained agreed perfectly with Ruge's account of ratanhin, which had formerly been considered by Wittstein to be identical with tyrosin, but which is really a homologous body of the formula, $C_{10}H_{13}NO_3$. Ratanhin is identical with Gintl's angelin, obtained from other vegetable extracts.

It does not appear to be a normal constituent of the extract, but rather a constituent of some substance used for adulteration, as all samples purporting to be pure extract, yielded no ratanhin; the usual adulterating materials, kino and catechu, do not, however, contain it, nor, when it is mixed with *Ferreira spectabilis*, does it appear likely that ratanhin is formed by reaction between the two substances, although the theory is plausible.

The method employed for obtaining ratanhin from the only samples that contained it, was to treat the extract with water, then precipitate by lead acetate, and finally precipitate the lead by hydrogen sulphide. The filtrate evaporated and left at rest for a short time yielded crystals, which were dried and washed with cold water. After precipitation of the calcium by ammonia and ammonium carbonate, crystals were obtained by spontaneous evaporation; these were again submitted to the same treatment, and on analysis yielded results answering to the formula, $C_{10}H_3 NO_3$. Ratanhin is insoluble in alcohol and ether, but soluble in ammonia,

from which it separates unchanged. No compound was obtained corresponding with dinitrotyrosin or nitrotyrosin nitrate. Ratanhin is distinguished from tyrosin by its reaction with nitric acid, which, on saturating the crystals with a small amount of water, cautiously dropping nitric acid into the mixture so that some of the original crystals remain undissolved, and heating the solution, changes to red, passing to blue, and finally to green, at which stage it gives red fluorescence. Like tyrosin, it forms an additional product with bromine.—*Journ. Chem. Soc.*, October, 1875, from *Ann. der Chemie*, clxxvi, 64.

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# MINUTES OF THE PHARMACEUTICAL MEETING.

The second meeting of the session was held November 16th, 1875, Dr. W. H. Pile in the chair. Members present, 75. The minutes of the last meeting were approved.

Professor Maisch made the following donations to the museum: *Lechea major*, Michaux (Pinweed); nat. ord., Cistaceæ, used in the neighborhood of Danville, Va., for chills and fever, and as a tonic. From Powers & Weightman, Rose-flowers, from the East Indies; a pale variety, having a fine odor. From Walter A. Taylor, Atlanta, Ga., a cotton-plant in fruit, showing the cotton. From Francis Murray, Key West, Florida, *Agave americana*, the unfolded leaves and a portion of the flower stem; it has been introduced from Mexico, and flowers at Key West in the open air in from three to four years, but in this climate it requires careful nursing, and flowers usually after 50 to 60 years. Attention was called to the proportionally small size of the roots; accompanying were several small plants for distribution. From Frederickson & Harte, New Orleans, specimens of the rice-plant in fruit. From Whitall, Tatum & Co., a set of thirty lettered Reagent Bottles. These bottles have the chemical names and formulas distinctly blown in the glass. From Mr. Atwater, representing the same firm, a specimen of amber-yellow glass prescription ware, recommended for such preparations as are sensitive to the light. Hans M. Wilder had called attention to the "Danish Pharmacopœia" directing such glass to be thus used. The color is given to the glass in Europe, by the addition of straw or cow-dung, or, in this country, of finely-sifted coke. Mr. Bullock stated it was no doubt effected through the agency of the protoxide of iron, the carbon preventing the formation of the green color due to ferric oxide. The color differs very much from the canary-yellow with a greenish tint, produced by uranium. Mr. Bullock presented from the Pennsylvania Salt Company a handsome pseudomorphous specimen of bicarbonate of soda, prepared from carbonate of soda.

On motion, a vote of thanks was tendered to these donors.

Dr. W. H. Pile read a paper entitled, "Notes on dilute phosphoric acid" (see page 529). Prof. Maisch inquired whether the acid thus obtained had been examined for ammonia, and how much it contained. Since 1858, a number of experiments were made by Scheurer-Kestner, Ordway and other chemists, with the view of observing the action of metals upon nitric acid, and the result appeared to

be that ammonia was invariably formed at a low temperature, and that its quantity increased as the temperature was lowered. Personne had obtained somewhat similar results by acting with nitric acid upon phosphorus, and since, in the proposed process, the action was moderated by immersing the vessel, it appeared to be probable that the finished phosphoric acid would contain notable quantities of phosphate of ammonium, to decompose which sufficient heat would be required to convert the ortho- into metaphosphoric acid. Further investigation with this process should be made, before it is used as a substitute for that of the "Pharmacopœia."

Dr. Pile remarked that the temperature to which the solution is raised is sufficient to drive off nitric acid, but he could not at present state as to phosphate of ammonium being present.

Prof. Maisch read a paper entitled "Notes on some medicinal and dietetic articles," by X. Landerer, Athens, Greece, honorary member of our College (see page 532).

Dr. Pile exhibited a piece of a barrel head, shattered by the recent explosion, the force of which seemed to be downwards and upwards, as described on page 525 of the November number.

Prof. Maisch exhibited "Leaflets for the Scrap-book," printed by M. S. Bidwell, Elmira, N. Y., in his pharmaceutical establishment. These contain brief notes on topics of interest to physicians and pharmacists. New remedies, analyses of nostrums and incompatibilities comprise some of the subjects of the "leaflets," by means of which interesting and useful information is brought to the notice of those to whom they are sent.

Allen Shryock exhibited a variety of lemon from Pueblo de los Angeles, in Southern California, the average weight of which is 8 ozs.; the yield of juice 25 per cent; the specific gravity of the juice is 1·0014, and each fluidounce requires 28 grains of bicarbonate of potassium for neutralization.

Charles Bullock presented the subject of Ozone, giving a history of its discovery, its chemical relations, the tests by which its presence may be recognized, and its use for various purposes. During the lecture, a number of interesting and entertaining experiments were made in illustration of the subject. On motion of Mr. Shinn, a vote of thanks was given Mr. Bullock for the entertainment given.

After deciding to meet next month again in the evening at 8 o'clock, the meeting adjourned.

WILLIAM McINTYRE, *Registrar.*

# PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

THE VERMONT PHARMACEUTICAL ASSOCIATION held its annual meeting October 13th, in the Free Baptist Hall at St. Johnsbury, President L. E. Sherman in the chair, A. W. Higgins, Secretary. The attendance was large, quite a number of ladies being also present. The main business of the first session was the election of new members, the reading of the reports of standing committees, and the Treasurer, and of the President's annual address, which was referred to a special committee. A Nominating Committee was appointed, which reported the following officers for

the ensuing year, who were duly elected: M. K. Paine, Windsor, President; A. O. Gates, Morrisville, and H. G. Day, Bradford, Vice-Presidents; A. W. Higgins, Rutland, Secretary; John E. Young, Vergennes, Treasurer.

During the evening, a grand reception and banquet was given to the Association by the St. Johnsbury pharmacists, many of the prominent citizens with their ladies being present; and during the day the Association paid a visit to the extensive Fairbanks scale works.

The third and last session was held on Thursday, October 14th, when several papers and the report of the Legislative Committee were read and discussed, after which the Association adjourned, to meet next year at Montpelier, Vermont.

After adjournment, the members with their ladies enjoyed a ride over the Portland and Ogdensburgh railroad as far as Greensboro, and back, the invitation having been tendered by the Superintendent of the road, Mr. W. H. Bryant.

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NEW YORK ALUMNI ASSOCIATION OF PHILADELPHIA COLLEGE OF PHARMACY.—The regular monthly meeting was held in Plimpton Hall, Tuesday evening, November 2d, Dr. von Weber in the chair.

The Secretary announced the death of James W. Hommann, one of the most active members of the Association. He died Monday, October 25th, aged 22 years and nearly 5 months. He was born in Green Bay, Wisconsin, June 3d, 1853. His parents died while he was quite young, leaving him to provide for and educate himself. He apprenticed with C. C. Hughes, apothecary, Eighth and Race streets, Philadelphia, and graduated from the Philadelphia College of Pharmacy in 1873, came to New York in 1874, where he resided until his death. He was elected a member of the American Pharmaceutical Association at the last meeting. Mr. Hommann was a zealous student, and his accomplishments had lead his friends to anticipate for him a brilliant career. Resolutions were adopted expressing sympathy of the members, to be transmitted to his brother.

Fred. W. Latz was elected a member of the Association.

A communication from the Board of Trustees of the Philadelphia College of Pharmacy was read, recognizing the Association, and offering greetings with wishes for its prosperity and usefulness.

Mr. Plummer read an interesting paper on Salicylic Acid. He recommends glycerite of starch as the best medium for its local exhibition. He finds it of little value for preserving infusions, &c., especially those containing tannin, which he thinks interferes with its action. Mr. Wilson said that, in a paper by Dr. Squibb, which was published last summer, it was stated that, if salicylic acid retarded the natural fermentation and digestion in the stomach, it could not properly be administered. He asked if any information had been gained upon that subject. Mr. Plummer stated that he thought such was not the case (see page 522 of November number), and that it is being prescribed for internal use by many prominent physicians of this city.

Mr. McElhenie read a paper on the vending of nostrums (see page 537). This paper was called out by an editorial in the "Medical Record," October 9th, under the title, "Shall it be a profession or a trade?" crediting the present status of the nostrum traffic to the over-sensitive pocket nerve of the pharmacist, and submitting

that a peremptory refusal to handle medicines of unknown constituents is the only means likely to prove successful in stopping their sale. Mr. McElhenie's paper elicited considerable discussion, generally sustaining him in his assertions that any rash acts on the part of the pharmacist would rather tend to advertise and cause the establishment of stores for the sale of patent medicines, and that the use of those medicines could be more effectually discouraged by the pharmacist while combined with his stock, by exposing the fraudulent claims made for them. The plan of the "Health Almanac" was specially commended.

Mr. Wellcome exhibited some Glen Flora mineral water, from the spring at Waukegan, Ill., which has gained an extended reputation through the West for its action upon the kidneys. Its main constituents are the bicarbonates of magnesium, calcium, sodium and iron, also a small amount of aluminia and silica.

He also presented some nitrite of amyl, put up in thin flask-shaped glass capsules, each containing ten minims, to be broken in the handkerchief or upon cotton, for inhalation. They are a device of Dr. T. A. McBride, of New York, and seem very practical.

The next meeting will be held on Tuesday evening, December 5th.

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THE RICHMOND PHARMACEUTICAL ASSOCIATION held its second annual meeting on Tuesday, Nov. 9th, Mr. R H. Meade occupying the chair and H. G. Forstman acting as Secretary. The following officers, to serve during the ensuing year, were elected: President, Hugh Blair; First Vice-President, Robert W. Powers; Second Vice-President, Jesse Child; Recording Secretary, Joseph Anthony; Corresponding Secretary, T. Roberts Baker; Treasurer, Geo. L. Cary; Executive Committee, William P. Poythress, Polk Miller, and W. A. S. Conrad.

The annual addresses and reports of the President, Recording Secretary, Treasurer and Executive Committee were read, after which Mr. H. G. Forstman delivered an interesting discourse on Salicylic Acid, which was afterwards discussed by the members.

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THE CALIFORNIA COLLEGE OF PHARMACY held its annual commencement at the Young Men's Christian Association, in San Francisco, on the evening of October 12th. After an address by the President, Professor of Chemistry Wm. T. Wenzell, the valedictory address was delivered by Wm. M. Searby, Professor of Materia Medica, which was responded to on the part of the graduates by R. C. Meyers. The degree of Graduate in Pharmacy was conferred by the President of the University of California, Professor J. Le Conte, upon the following gentlemen: Robert C. Meyers, of New York; Thomas D. Graham, England; Gaston E. Bacon, France; Adolph Kahn, New York; F. P. McLean, New Hampshire.

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PHARMACEUTICAL SOCIETY OF GREAT BRITAIN—The first pharmaceutical meeting of the session 1875–76 was held October 6th, Mr. Thos. H. Hills presiding. Numerous donations to the library, museum and herbarium were made, after which Professors Redwood, Bentley and Attfield reported on the lectures and exaimnations during the preceding session. Mr. Chas Ekin, F. C. S., then delivered the inaugural sessional address to the students.

PHARMACEUTICAL SOCIETY OF PARIS.—Mr. Planchon presided at the meeting held October 6th, at which Mr. Stan. Martin presented a variety of green maize, known under the names of *giant*, *Nicaragua*, etc., the fructification of which is not accomplished in France. Prof. Soubeiran remarked that fruit could be obtained, if the maize was started, at the proper time, in the warm or hot-house, and the plants transferred to the open air after all danger of frost was over. Mr. Latour had raised this variety, in a favorable location, in the military hospital of Saint-Martin; the grains, however, were attacked with rust.

Mr. Petit gave an account of his investigations of the action of diastase upon starch, which is thereby split into two sugars; one of these, forming two-thirds of the entire product, is fermentable and reduces Fehling's solution; the other, which has not yet been sufficiently studied, forms one-third of the product, is fermentable, and does not reduce the copper-soda solution.

Mr. Méhu presented crystallized sulphide of mercury, which was formed in a very alkaline solution of sulphide of mercury in sulphide of sodium.

Mr. Petit reported on the continuance of his researches concerning the changes occurring in fruits while ripening; he observed that in the melon, the grape-sugar is transformed into crystallizable cane-sugar. Mr. Latour remarked that, some years ago, in Algiers, the maturation of the sorghum was uniformly accompanied by the transformation of the grape-sugar into crystallizable sugar.

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# EDITORIAL DEPARTMENT.

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THE VENDING OF NOSTRUMS.—Ever since we have been initiated into the mysteries of the art and science of pharmacy, we have flattered ourselves that we belonged to those who have imbibed from their preceptors an aversion towards all kinds of medicinal preparations that have about them the odor of secrecy, no matter whether they are popularly known by the name of *patent medicines*, or whether they go by the cognomination of *medicinal specialties*. In this it appears we have been seriously mistaken, and, what is worse, American pharmacy may possibly be the sufferer from opinions entertained by us. At least, we have been informed by the New York "Medical Record" of October 9th, a copy of which has been kindly sent to us by a friend, that "the confession embodied in the remarks of the Permanent Secretary at the recent meeting of the American Pharmaceutical Association, that it was impossible to check the sale of patent medicines, even by respectable druggists, because the public insisted on purchasing them, is an illustration in point on which to base a belief that over-sensitiveness of the pocket nerve, which is so marked a characteristic of human nature, may possibly keep pharmacy in the list of commercial, rather than of professional pursuits."

Now, it happens that the Permanent Secretary of the American Pharmaceutical Association never said what the "Record" attributes to him; what he did say was, that, "as long as patent medicines are called for by the public, pharmacists will be compelled to keep them, and that their efforts will amount to nothing until the pub-

lic has been well informed of the dangerous nature of these nostrums." We are aware that the stringent regulations, as they exist in continental Europe, have been unavailing in abolishing the vending of secret remedies; on the contrary, the evil is on the increase there, and, guided by the experience of other nations as well as our own, we have not yet been able to enroll ourselves with the advocates of prohibitory measures, as the "Record" inclines, and we still believe that what that paper is pleased to call a "halfway measure," will have a better effect upon the public than the proposed peremptory refusal to sell medicines of unknown composition, although we do not expect that the "Popular Health Almanac" will sweep the host of secret preparations at once among the things of the past.

Does the "Medical Record" know in what manner many of these nostrums, whether they appear under the unvarnished garb of "patent medicine," or under the more plausible and alluring one of "specialty," are introduced? The editor of the "Medical Record" will merely have to inquire at any pharmaceutical establishment on Broadway or any other thoroughfare of New York, and on examining the prescription file, he can easily learn how many proprietary medicines pharmacists are compelled to keep because they are *prescribed by physicians*; or he may refer to the advertising columns of many medical periodicals, and he will find articles advertised and even editorially recommended, which have been exposed as fraudulent and unworthy of confidence by the pharmaceutical press. Still, we do not arraign the medical *profession* for such shortcomings, even though prominent physicians may be guilty of the same.

Opinions may differ as to the best way for abating a nuisance and abolishing an evil; we believe that a proper education of the public will do a hundredfold more good than a peremptory prohibition or individual refusal to sell secret medicines, including such specialties as elixirs and similar pleasant drinks.

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THE ALKALOIDS OF HYDRASTIS.—The following letter from Prof. A. B. Prescott, University of Michigan, School of Pharmacy, explains itself:

ANN ARBOR, 18th Nov., 1875.

*Prof. John M. Maisch:*

DEAR SIR—I am under obligations for your kindness in calling my attention to the statement in my report of Mr. Burt's work with hydrastis, on page 482 of the last number of your "Journal," that the hydrastia crystals were pale yellow, whereas they are properly described as colorless, when pure. It should have been stated in the report that the crystals were pale yellow instead of colorless, *because* not fully purified. However, it was Mr. Burt's only purpose, in crystallizing the hydrastia, to obtain crystals of typical *shape*, for comparison with the crystals of the "third alkaloid." Mr. Burt's notes state that his precipitate of hydrastia—formed in the filtrate from berberina hydrochlorate, by just neutralizing with ammonia—was washed for some time with water containing a little ammonia, then dissolved in alcohol, and crystallized directly from this solution. As so obtained, they were pale yellow, as faithfully represented in Mr. Burt's colored drawings, and this was stated in my report. Now, several crystallizations, or else washings with suitable solvents, are needed to obtain hydrastia colorless. At the same time, the crystals tinged by traces of the intensely yellow berberina, have the same shape as colorless crystals, all authorities agreeing that they are square prisms, though sometimes described as pale yellow. In 1862, Prof. PROCTER stated, in remarking upon Mr. Mahla's observations ("Am. Jour. Phar.," xxxiv, p. 144), "I have a sample of Mr. Durand's hydrastine, and it is not berberine, but crystallizes in light yellow crystals, of considerable size."

Now, as to the crystallographic distinction between the "third alkaloid" and the others—designed to be shown by Mr. Burt. It is true that this evidence is, of itself, not conclusive, because square prisms might be, under other conditions, obtained in needles, the angles of which are not brought out; but, as a matter of fact, hydrastia has not been found in needles, to my knowledge, though crystallized under the

same conditions as the "third alkaloid." That is, the crystallographic evidence seems to strengthen the chemical evidence of the existence of a third alkaloid in hydrastis.

Again thanking you for your attention to the matter,

I am, very truly yours, ALBERT B. PRESCOTT.

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MORE EVIDENCE OF THE PRESENCE OF LEAD IN MURIATIC ACID.—The paper by Prof. E. Scheffer published in our last number, has drawn attention to an impurity in muriatic acid occasionally noticed before. The following communication may *possibly* refer to an acid from the same source as Prof. Scheffer's; but it shows that muriatic acid containing lead is at present found in several localities:

MUSCATINE, IOWA, Nov. 19, 1875.

*Editor of the American Journal of Pharmacy:*

A few days ago I made some tinct. ferri chlorid from a solution of chloride of iron, obtained from a manufacturing house of St. Louis, Mo. The tincture, after a short time, began to deposit small crystals in abundance. The article in the November number of the "American Journal of Pharmacy," by Mr. E. Scheffer, at once aroused my suspicion to the presence of lead in the muriate of iron solution. The crystals, after separation from the tincture and washing with cold water, were dissolved in hot water. The solution gave, with bichromate of potassium, a yellow precipitate, with iodide of potassium, a bright yellow precipitate. A quantity of the crystals mixed with carbonate of sodium, and treated on charcoal with the blow-pipe, yielded a globule of lead. Lead undoubtedly exists to a great extent as an impurity in commercial muriatic acid and solutions of iron made therefrom, and they should be submitted to a careful examination before being used or dispensed.

Yours truly, FRED. REPPERT.

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# REVIEWS AND BIBLIOGRAPHICAL NOTICES.

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*Der Kaffee in seinen Beziehungen zum Leben. Für Haus und Familie geschildert.* Von Dr. H. Böhnke-Reich. Leipzig: Thiele & Freese. 1875. 12vo, pp. 65.

Coffee in its Relations of Life.

Quite an interesting and entertaining little book, which gives a brief history of the introduction of coffee and its increased use, notes on the cultivation of the coffee-plant and on its commercial importance, the constituents of the seed, the preparation of the beverage, its effects, its substitutions and adulterations, and the various uses to which it is put. The author has endeavored to describe, in as small a space as possible, all that is important or interesting concerning this staple article, and he has done it in a manner which renders the pamphlet interesting to all cultivated persons. It is embellished with several wood-cuts.

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*Practical Hints on the Selection and Use of the Microscope; intended for beginners.* By John Phin, Editor of "The Technologist." New York: Industrial Publication Company. 1875. 12mo, pp. 131. Price, cloth, 75 cts.

Many branches of science require the use of the microscope, botany and Materia Medica not less than many others, and the necessity for it is constantly increasing. We have a number of larger works on this instrument and its uses, most of which are too voluminous for the beginner. The little volume before us appears to supply this want. Plain and concise in its language, clear, though brief, in its descriptions, practical in its directions and moderate in price, it appears to us to fulfil a want which is more particularly felt by the beginner, for whom the little volume seems to be specially intended.

*En Række Drikkevandsundersögelser et forsög i retning af en Drikkevandsstatistik.* Af August Fleury. Med et forord af Dr. E. Hornemann. Kjobenhavn: A. F. Höst & Sön. 1875. 8vo, pp. 41.

A Series of Examinations of Drinkwater, and an Attempt at a Statistic of Drinkwater.

The author was a Danish pharmacist who, after having studied under S. M. Jörgensen, Jul. Thomsen and others, went to finish his education under Pettenkofer at Munich, where he died at the age of 25 years. After a critical review of the water analyses as usually conducted in the various States of Europe, he insists upon the necessity of a uniform system, and suggests that in all cases, not only the water which is being used, but likewise the water which may be used hereafter, should be frequently analyzed, with regard to the hygienic conditions of the locality as well as the chemical composition. The constituents to be determined are ammonia, nitric, carbonic, hydrochloric and sulphuric acids, carburetted hydrogen and the amount of residue left on evaporation; besides which, the appearance of the sediments under the microscope, depth of well, etc., should be noted. Forty different waters of Copenhagen had been thus examined by the author, who then considers the methods for estimating the quality of drinkwater, in which more than 0·013 gram of nitric acid in the litre (the amount contained in rainwater) would indicate a contamination with organic matter, while muriatic and sulphuric acids in larger quantities would point towards a contamination with sewage. Permanganate of potassium alone is not a reliable criterion for the quality of drinkwater.

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*The Cholera Epidemic of 1873 of the United States.* Washington: Government Printing Office. 1875. 8vo, pp. 1,025.

The main portion of the volume before us consists of a history of the cholera epidemic of 1873 in the United States, by Eli McClellan, M. D., Assistant Surgeon U. S. A.; a history of the travels of Asiatic cholera, by John C. Peters, M. D. and Eli McClellan, M. D., and a bibliography of cholera, by John S. Billings, M. D. These are preceded by some considerations on the introduction of epidemic cholera through the agency of the mercantile marine, and suggestions of measures of prevention, by John M. Woodworth, M. D., Supervising Surgeon of the U. S. Merchant Marine Hospital Service.

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*Medicinal Plants*; being a Description of the Principal Plants Employed in Medicine, and an Account of their Properties and Uses. By Robert Bentley, F. L. S., and Henry Trimen, M. B., F. L. S. Philadelphia: Lindsay & Blakiston. Large 8vo. Part I. Price, $2.00.

On page 384 of the present volume, we have noticed, from proof-sheets received, the above work, of which part 1st is now before us, which contains plates and descriptions of *Solanum dulcamara*, *Digitalis purpurea*, *Mentha viridis*, *M. piperita*, *Mallotus philippensis*, *Croton eluteria*, *Cr. tiglium* and *Stillingia sylvatica*. The plates are faithfully executed and handsomely colored, and the letter-press is all that can be desired.

# INDEX

## TO VOL. XLVII (VOL. V, FOURTH SERIES) OF THE AMERICAN JOURNAL OF PHARMACY.